- Electric heater drives
- Pipe, fittings, valves and pumps in general mill service
- Abitibi's pulpwood and chip conveying system
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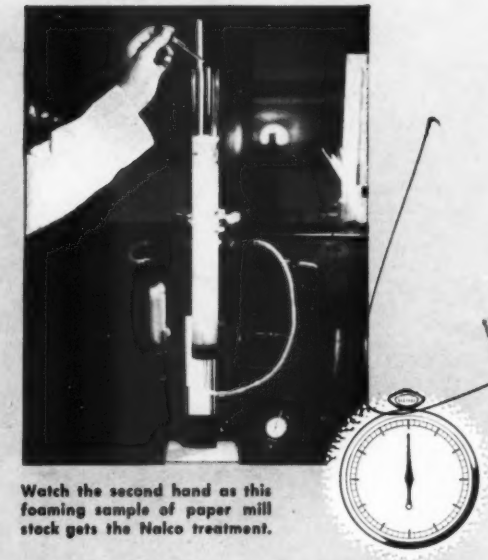
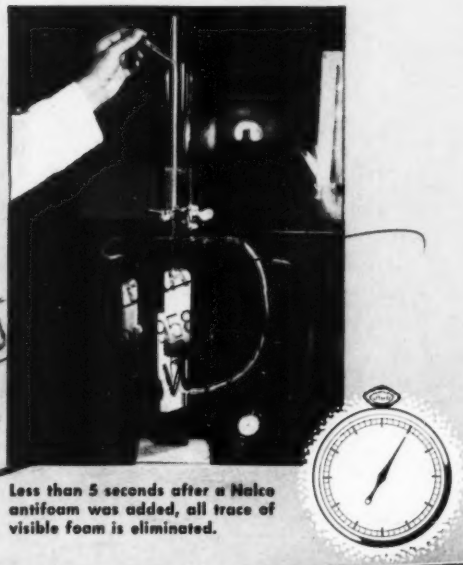
The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE



Watch the second hand as this foaming sample of paper mill stock gets the Nalco treatment.



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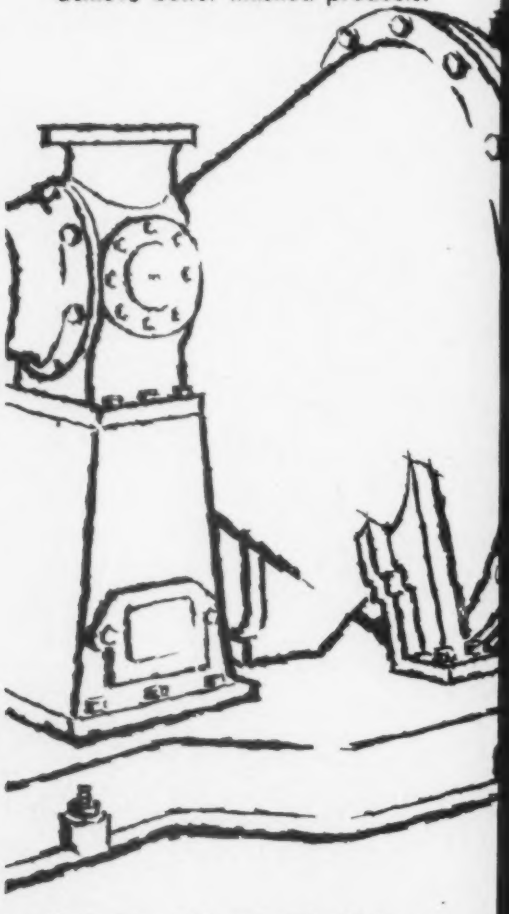

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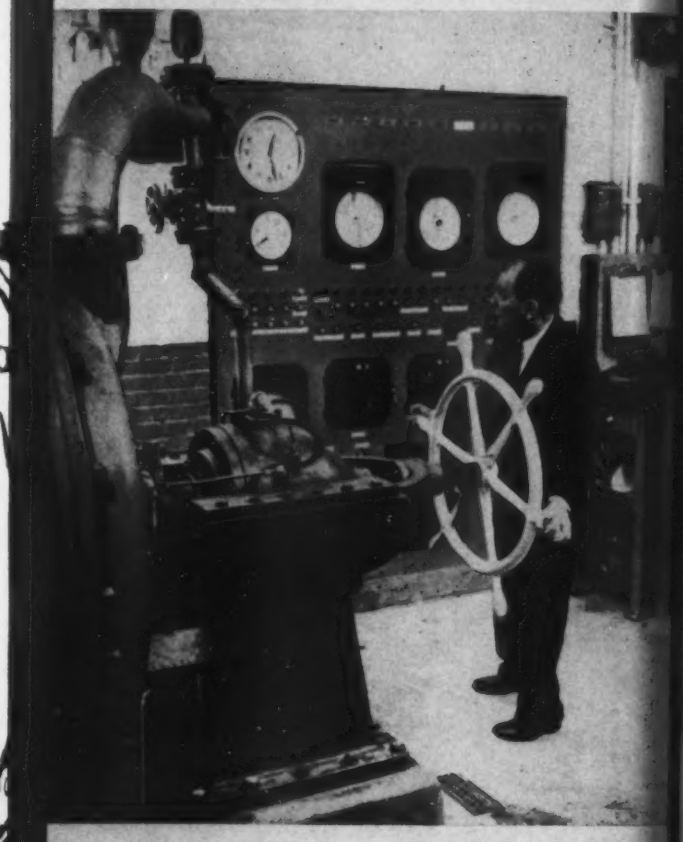

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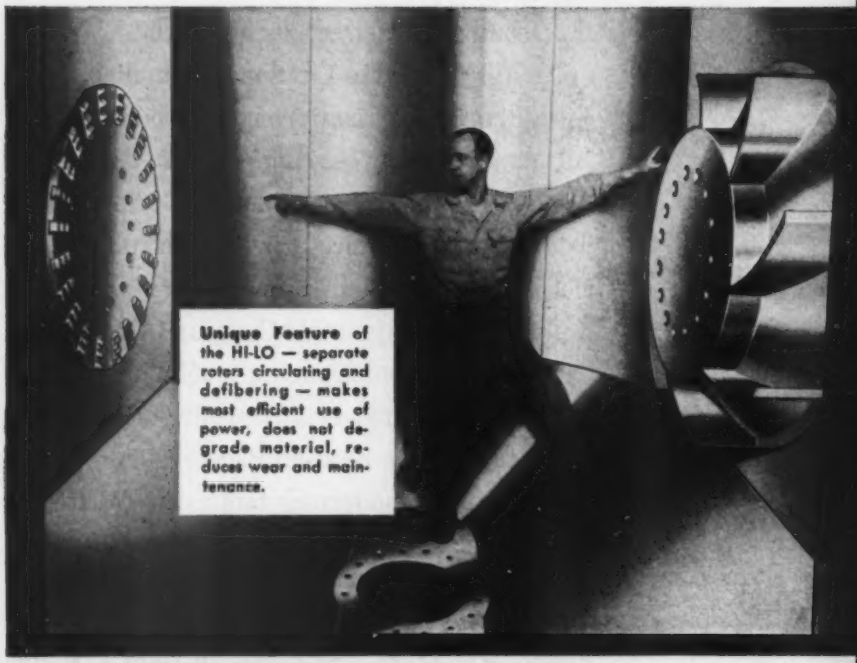

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The Paper Industry

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VOLUME 40 **NUMBER 6** **SEPTEMBER 1958**

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From our point of view..

What do our readers want?

The editorial objective of The PAPER INDUSTRY magazine is to make itself read and to disseminate information that is indispensable for increasing the pulp and paper industry's productivity. This objective is pursued through a sincere effort on our part to explore, interpret and anticipate our readers' wants.

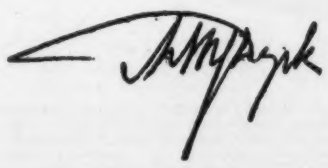
In our contact with The PAPER INDUSTRY's readers we have come to appreciate the fact that it is absolutely essential for the majority of our readers to keep informed. The great majority of them belong to the category of mill management who is responsible for planning and deciding on new expansions; developments and operation of the mill facilities, and the procurement of equipment and materials.

Our recent survey of reader wants disclosed a gratifying trend in corroboration with our editorial objective that our readers do not look to our industrial publication for entertainment or diversion. They want information that is comprehensive but concise, technically accurate and in good balance with relation to all aspects of pulp and papermaking. Our readers fully approve of the technical material that The PAPER INDUSTRY is giving them in clear, concise but comprehensive form. In fact, many demand even more of such technical detail.

It is further appreciated by our audience that the information it wants is not solely confined to the feature articles or the various editorial departments in our publication. A wealth of information is equally contained in the informative advertising pages, where a few succinct paragraphs constitute an information service that is often unmatched by an entire article.

It has been said that a good informative ad cannot be buried among the contents of a magazine, no matter what its location. This truism has been fully corroborated by our reading audience — who has reached its high level of proficiency and leadership through keeping informed.

It is our privilege to be of service to our discriminating readers and give them the information they want. Only through such service can we build prestige for our own publication, and this in turn enhances the service we can give to our advertisers.



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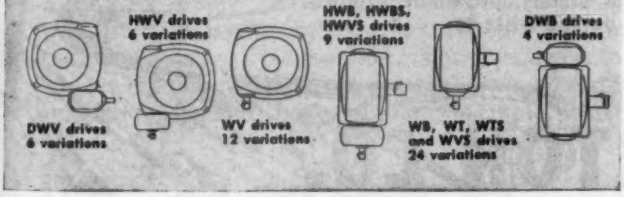

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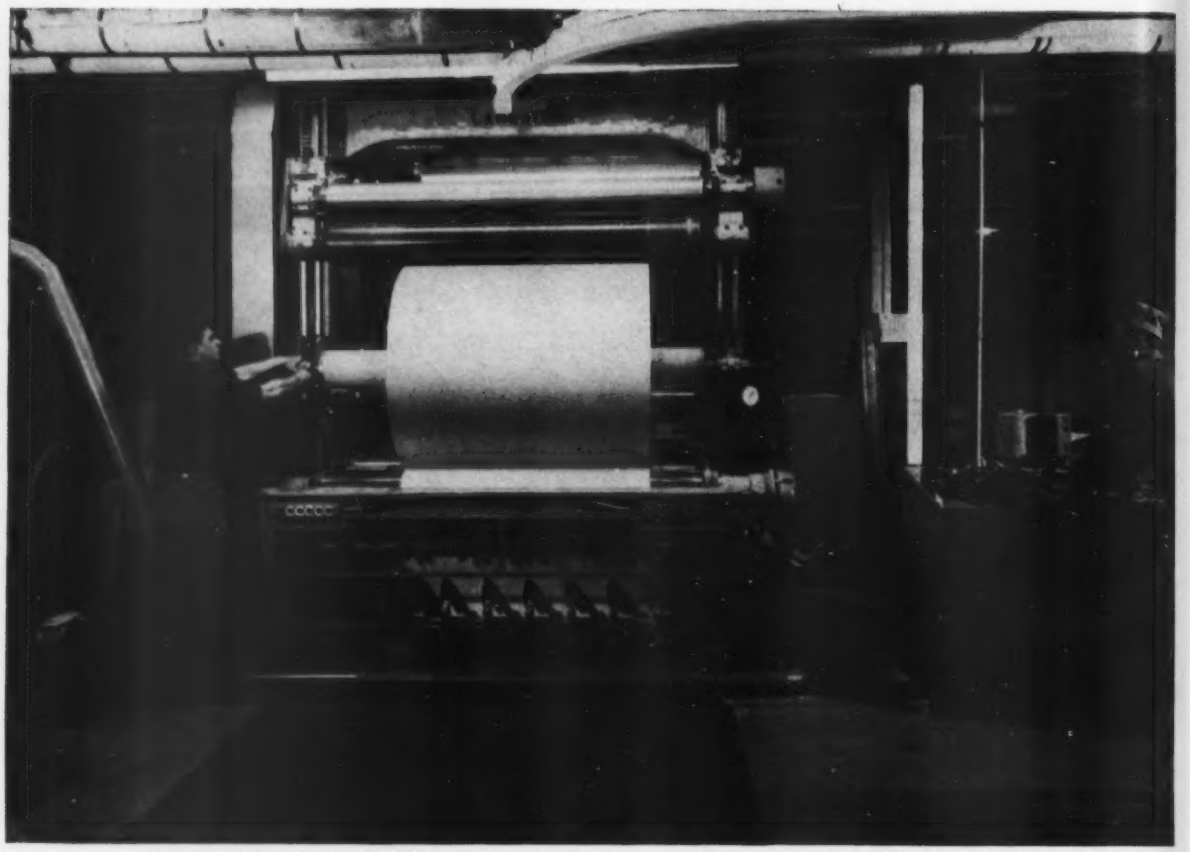

New 72-inch Type CA Langston Slitter and Winder in Marathon Corporation finishing room handles rolls up to 60 in. in diameter at speeds up to 1500 ft. per minute. Finished rolls are lowered by hydraulic drop shown in foreground.

New Langston Slitter and Winder helps Marathon cut operating costs

This new Langston Slitter and Winder installation at Marathon Corporation's Rothschild, Wis., mill is already helping the company cut costs and speed processing of quality paper and board.

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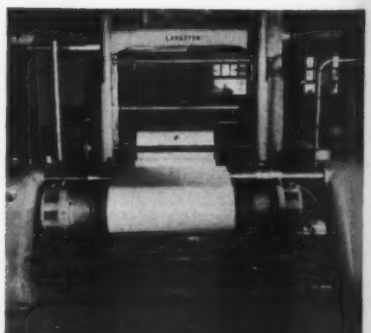

Langston Shaftless Unwind Stand eliminates the time-consuming, back-breaking task of hoisting heavy shafts into place. The hydraulically actuated arms reach out, pick up the roll and lift it to running position—a 1-man, push-button operation.

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Above: Digester building at Jacksonville, Florida shows arrangement of some of the CB&I-built structures at expanded St. Regis pulp, paper and board mill. Accumulator was erected by CB&I and furnished through Foster Wheeler Corp.

PP26

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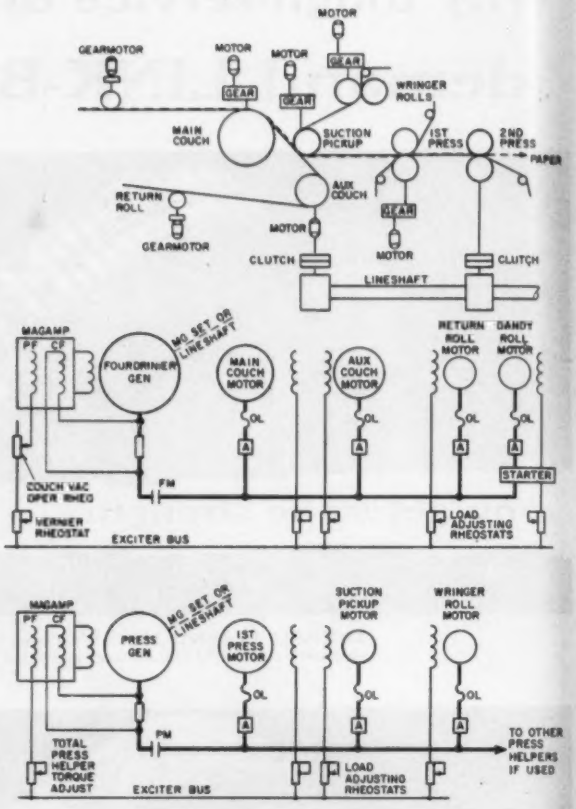
Electric helper drives for fourdrinier machines

S. J. CAMPBELL
Industry Engineering Department
Westinghouse Electric Corp.



Typical fourdrinier helper drive system for a lineshaft-driven machine with a suction pick-up. The machine layout is shown in the top diagram, while the principal electrical circuits for fourdrinier and press helper drives are shown below.

THE USE OF electric helper drives on fourdrinier machines has shown such a marked increase in recent years that today any new machine rated at over 300 tons or operated at above 1500 fpm is almost certain to have one or more such units, whether the basic machine drive is sectional electric or mechanical line-shaft.

Typical of this trend is a machine now being built, a 236-in. 3000-fpm kraft bag machine with a mechanical differential lineshaft drive. In addition, the fourdrinier section of this machine will have four helper motors totalling 395 hp, while the first press section is to have six helper motors totalling 405 hp. It will also have three top roll helper drives.

Another example is found in a newsprint machine that was originally designed for top speed of 1500 fpm, but which has been revamped with the addition of a suction pick-up section to operate at 2000 fpm. A 200-hp helper drive has been added to the fourdrinier section, and three helper motors totalling 230 hp have been added to the pick-up felt section.

What is an electric helper drive

An electric helper drive is designed to apply an essentially constant torque, as set by the operator, to an indrive shaft regardless of the production speed of the machine. The speed of the machine section must be maintained by some other power input to the section; this could be a mechanical indrive or, in the case of a sectional electrical drive, a speed-regulated motor. A helper drive not only relieves the torque load on the speed-regulated indrive or the mechanical indrive, but also permits torque to be applied at more than one location on the machine section.

Where and why are electric helper drives used

A listing of the places where helper drives are used advantageously would certainly include fourdrinier sections with multiple indrives. Recent designs of fourdrinier sections may have a main couch roll, an auxiliary couch or wire turning roll and one or more bottom wire rolls. The speed of the fourdrinier section will be fixed by a main drive on the auxiliary couch roll. Helper drives are applied to the main couch roll and to the bottom wire rolls. On higher-speed machines, helper drives are also applied to the lump breaker and the dandy rolls. Fourdrinier helper drives distribute the load on the wire and apply torque to the points where it is needed. In the case of a mechanical lineshaft drive, this also permits using a smaller size differential unit and air clutch. In any case, wire life is increased.

Press sections using a suction pick-up scheme will have three or more helper drives in addition to the primary indrive. Helper drives are usually applied on the suction pick-up roll, the wringer rolls, the transfer

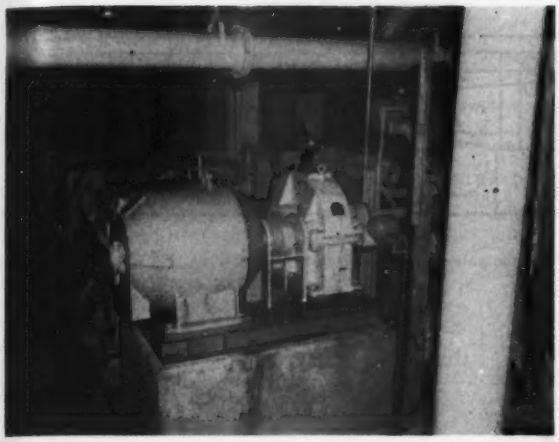


Fig. 1—Wet end electric helper drives on a 276-in. 2500-fpm lineshaft-driven newsprint machine. The 300-hp couch motor and gear are visible in the foreground.

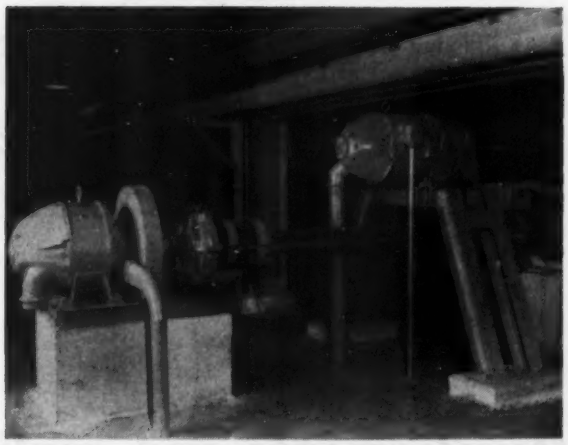


Fig. 2—Top roll helper drive added to the size press on a machine having an existing sectional drive. Gearmotor was used because of reduced space requirements and to permit simpler mounting.

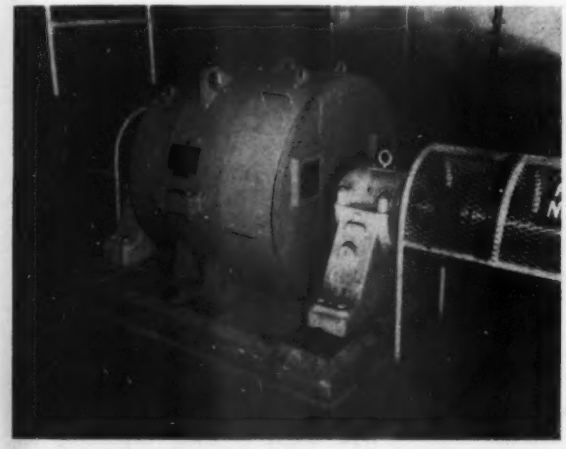


Fig. 3—Lineshaft-driven 300-kw, 1000-rpm dc generator for fourdrinier helper drives.

Fig. 4—Dc control cubicle and power supply M-G set for wet end helper drives applied to existing lineshaft-driven machine.

press and on the felt turning rolls (Fig. 1). Each of these rolls has a suction box as well as the roll bearings. By having helper drives that apply torque as required to turn these rolls, the felt can be designed primarily for water removal instead of also having to act as a drive belt. This results in better sheet formation as well as longer felt life.

In another application, helper drives applied to single indrives on a mechanically-driven machine permit design of the mechanical drive parts (including gears, clutches and differential units) to stay within practical limits of size and to afford economy of manufacture. A number of helper drives of this type have been applied on the couch sections of large kraft machines.

Helper drives are also applied to top rolls on wet end presses, size presses and breaker stacks, when high nip pressures are to be used. These top roll helper drives eliminate the need for large amounts of power to be transmitted through the felt and the sheet at the roll nips (Fig. 2). An interesting example involves the presses on a pulp machine: The third press section of a pulp machine, when operated at designed nip pressure, may require more driving power than the entire fourdrinier section. A recently installed pulp machine includes top roll electric helper drives on each of the three press sections.

When the tonnage or the top speed of an existing machine is to be increased, helper drives can often be applied to sections that would otherwise be overloaded. For example, a large kraft board machine was revamped recently for higher tonnage. With this increase in tonnage, the fourdrinier drive would have been overloaded. Rather than replace the existing drive unit and its power supply generator, it was found to be more economical to apply a helper motor to the existing drive, connected to a shaft extension on the existing speed reducer. In addition, this allowed complete installation of the helper equipment right up to the output coupling without requiring a machine shutdown.

Basic drive elements

A typical electric helper drive consists of a dc motor and speed reducer

(Continued on Page 359)

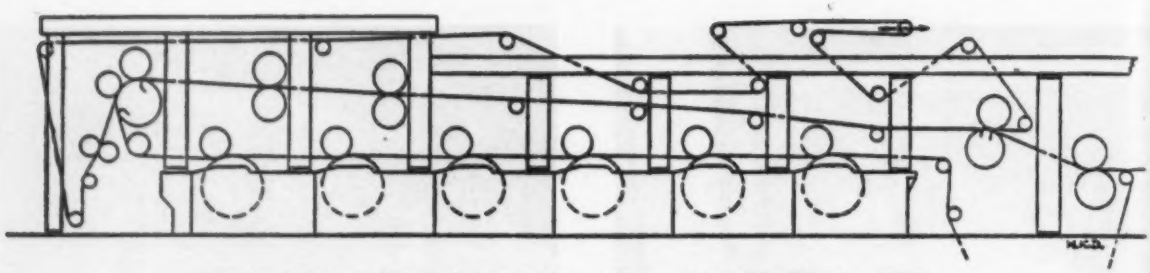


Fig. 1—Arrangement of a cylinder type Stevens' former patented by Beloit Iron Works.

Developments and applications of suction former*

D. W. CURTIS
Beloit Iron Works

The sheet made on the suction former is characterized by absence of streaks and by an unusual uniformity in basis weight and caliper.

THE SUCTION FORMATION equipment that to date has had the broadest commercial application is the type originated by Sam Stevens of Erving Paper Mills, Erving, Mass. Continuing development and application of this equipment is being carried out by Beloit Iron Works.

Fig. 1 illustrates an arrangement of the Stevens' type of unit. Formation is shown to be carried out on a mold that can be generally described as similar to the conventional cylinder mold. The mold is of open construction and carries both a backing wire and a forming wire.

A low-vacuum is maintained in the vat. The equivalent of a Beloit air pressure-loaded headbox, complete with its distributor and rectifier rolls, is used to bring the flow of stock and water in a completely dispersed and uniform manner to the formation zone. A stainless steel bottom lip is positioned close to the forming wire, and a special curved top lid assembly covers a part of the forming wire immediately after the bottom lip.

The proportioning of these parts, together with the adjustments provided, make it possible to control the relative speeds of stock and water flow, and of the forming wire to bring about optimum development of strength in the resulting sheet.

When all details of proportioning and design are properly carried out, the resulting sheet is characterized by absence of streaks or other imperfections in formation, and by unusual uniformity in basis weight and caliper. The controls provide the operator with ready means for varying sheet strength characteristics in both machine and cross machine direction.

This type of suction former has been used in the Beloit package type tissue machine. A number of these machines are now in service on toilet tissue, napkin stock and toweling.

A modification of this arrangement replaces the forming wire with the equivalent of a fourdrinier wire. The formed sheet, in this case, is carried away from the mold on the wire and passes down to the couch position, where either a pick-up type or suction type couch is used, depending on sheet weight and other factors.

Suction forming equipment of the type shown in Fig. 2 can be incorporated readily into a cylinder type wet end. The number of forming units in an installation will depend on the number of different types of stock used in making up the sheet, and on the basis weight required.

Operating experience in the cylinder machine field

Actual operating experience with the suction former in the cylinder machine field is still limited. However, it does include its use for top liner, and also for the formation of the complete sheet.

The first studies and the first installation of the Stevens' former in the cylinder machine field were made at the top liner position. It was felt that the former in this position would result in a substantial improvement in formation and also would give the best coverage with a minimum use of the expensive top liner furnish. Experience to date, in the range of from

*Abridged from a paper presented at the 39th Annual Convention of the American Paper and Pulp Mill Superintendents Association, Boston, June 3-5.

less than 2 points to more than 5 points of top liner, has been most encouraging both from the standpoint of appearance and of printing characteristics.

When minimum amounts of top liner furnish are used, as is to be expected, the character of under liner formation tends to show through regardless of uniformity of top liner formation. The use of a suction-former unit at the under liner position, therefore, seems to be indicated for most installations where minimum use of top liner furnish is important.

Uniformity in every ply of the board

In cylinder machine operation, where appearance and printing characteristics of the board are viewed most critically, recent experience has emphasized the importance of uniformity in every ply of the board. Some calendering is always necessary. However, coarse imperfections in the way of streaks or clots that may be present in central plies of the board have a disturbing way of reflecting themselves in the surface as highlights, mottles or an actual difference in caliper. One effect of such irregularities is the frequent need to set a printing press for a deeper or harder contact between the plate and the board than would be necessary if a more uniform board surface were available. Among the difficulties chargeable to non-uniformity in the board being used at the press are short life of printing plates, excessive ink consumption and, worst of all, not-quite-satisfactory print jobs.

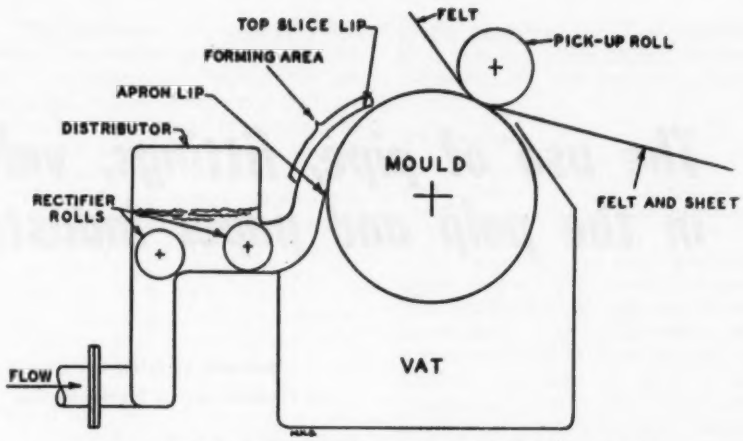


Fig. 2—A cylinder type suction former patented by Beloit Iron Works.

The high degree of uniformity in each ply of cylinder board, when all vats in the machine are of the new suction former type, is a most interesting characteristic in the recent developments. While actual operating data are not yet available for release, it is possible to report that uniformity of basis weight and caliper has been exceptionally good. Also, the uniformity of surface finish has been most satisfactory.

Our experience with this type of equipment in the paper field has been at speeds up to about 1600 fpm. We do not find any evident limitation in this area that known design features could not remove. In cylinder machine installations, it seems probable that good operation at machine speeds in excess of 1000 fpm may be realized in the near future.

Electric Helper Drives

(Continued from Page 357)

for the actual drive unit, a power supply dc generator, a dc control cubicle and an operator's control station.

The dc motor is usually totally enclosed, force ventilated from a separate blower. Non-ventilated or fan-cooled motors are not usually used, because they would require oversized machines, and space is usually at a premium around the wet ends of fourdrinier machines.

The power supply dc generator is driven from the lineshaft or from a separate M-G set. A lineshaft-driven generator will result in a lower first cost and can be coupled directly to the lineshaft (Fig. 3). When a lineshaft-driven generator is used on a machine having greater than a 4-to-1 production speed range, a series booster generator is usually required for IR drop compensation. This booster generator is driven from a separate M-G set. A rule-of-thumb to follow in deciding how to drive the helper generators on new mechanically-driven machines is to use a lineshaft generator if the prime mover is a steam turbine and to use a separate M-G set if the prime mover is a dc motor. This arrangement will usually result in the lowest first cost. On an existing machine, however, if the prime mover would be overloaded, a separate helper drive M-G set must be used.

The control cubicle (Fig. 4) includes the necessary armature contactor, overload relays, sequencing relays and regulating equipment. The type of regulator used in most cases is a current regulator. In a dc motor torque is proportional to the product of field flux and the armature current. By holding motor field flux constant and regulating for constant armature current, constant torque is obtained over the production speed range. Static regulators, such as magnetic amplifiers, have found wide usage in helper drives.

If operation of the machine section is such that the section is started with open nips, a current regulator is not suitable because there is nothing to maintain correct speed of the helper-driven roll when the nips are open. This would be the case when top roll helpers are used on breaker stacks and size presses, where the nips are closed only after the sheet has been passed through. For these cases, voltage or speed-regulated systems can be used. These systems usually cost more than current-regulated systems because one or more pilot generators are required.

Helper drives for fourdrinier sections may use a vacuum-operated rheostat to calibrate the amount of torque being applied by the helper drive. The vacuum-operated rheostat obtains a signal from the couch vacuum and calibrates helper torque for the conditions of no stock on the wire to full stock on the wire. The vacuum rheostat can be mounted in a separate cubicle or adjacent to the vacuum lines in the couch section.

The operator's controls are usually mounted in a desk on the tending side of the machine. On mechanically-driven machines, the con-

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The use of pipe, fittings, valves and pumps in the pulp and paper industry

ROLAND L. ALLEN JR.
Vice President, Eastern Engineering Co.

Part IV — The application of pipe, fittings, valves and pumps in general mill services

THE GENERAL MILL piping services (cold water, hot water, mill air, instrument air, drinking water, floor and roof drainage and process steam and condensate) are not difficult to pipe the various use points within the mill, but the keynote is dependability.

These services are vital to the satisfactory continual operation of the mill and usually must be kept available even during periods when the mill is not in production. For this reason, each system must be arranged to allow for isolation of any portion of the system during emergencies or necessary maintenance without affecting the remainder of the mill.

Pumps, where they are required for these services, should be high-quality dependable units. Spare pumps should be provided and installed in the system in such a manner that any pump can be taken out of service for repairs or maintenance without affecting the system or reducing capacity.

Piping should be adequately sized to accommodate the peak loads and in most instances should have reserve capacity to allow for future expansion or speed-up of the process areas being served.

Both pumps and piping should be carefully and adequately valved to allow for isolation of any given branch system.

Cold fresh water

Since pulp and paper mills use water in great quantities, piping and pumps for this service should be selected and designed with care. Cast iron bronze trim pumps are usually the most economical type and give very satisfactory service when well-built high-quality pumps are selected and properly maintained.

The piping materials normally used in underground service for water are cast iron, asbestos cement, reinforced concrete and coated and wrapped carbon steel. All give very satisfactory service when properly installed.

For service above ground, carbon steel pipe is by far the most used material. It is used with carbon steel welding fittings and cast iron flanged fittings. The welded installation is the cheapest.

Other piping materials used for above-ground service are spiral welded carbon steel, galvanized carbon steel, galvanized spiral welded carbon steel, wood-lined steel, asbestos cement, stainless steel and cast iron. The use of wood-lined steel, asbestos cement and stainless steel for above-ground service is rare, but when they are used it is usually to reduce product contamination from the slight rusting of the inside of the carbon steel pipe caused by the waters of some areas.

For above-ground water piping in sizes 2 in. and smaller, it is a good idea to use screwed galvanized pipe and fittings to combat the rusting of the outside of the pipe caused by sweating in the humid mill atmosphere.

Water piping should be designed for a velocity of 8 to 10 fps.

Cast iron bronze trim valves are usually satisfactory for water service and are the most economical in sizes 2½ in. and larger. Valves 2 in. and smaller may be solid bronze.

Hot water

Hot water is a more difficult liquid to handle than might be thought. The temperature (120 to 180°F) speeds up the rate of corrosion in many cases to the point where failure may be rapid.

For hot water carbon steel piping is usually not satisfactory, and stainless steel has been known to fail in less than six months where less than 20 parts per million of chloride was present. Copper is usually a satisfactory material but will fail if the water is alkaline. Wood-lined steel pipe is usually satisfactory for most hot water services.

Pumps for hot water service may be cast iron bronze trimmed and should be selected with a low required net positive suction head, and they should be installed in a position that will give a high available net positive suction head.

Hot water piping should be designed for a velocity of 5 to 6 fps.

Cast iron bronze trim valves are usually the most satisfactory for hot water service in sizes 2½ in. and larger and solid bronze valves for sizes 2 in. and smaller.

Mill air

Mill air piping is usually carbon steel. In sizes 2½ in. and larger it

should be all welded to reduce the maintenance of gasketed joints. In sizes 2 in. and smaller screwed construction is normally used with cast iron or malleable iron fittings.

Mill air piping should be designed for a flow velocity of about 1000 fpm.

Valves for mill air service should have seats and discs designed for tight shut-off, and the discs may have a facing of resilient material. The stem packing gland should be deep so that ample packing can be installed, and the gland nut should be kept tight to prohibit any brokage. If slight leakage occurs through the packing, the leaking air will dry out the packing to the point that no amount of tightening of the gland nut will stop the leak.

An appropriate number of adequately-sized drip legs should be installed in the system so that condensation and oil carried over from the compressors can be drained periodically.

Instrument air

An instrument air system is a necessity in the modern pulp and paper mill. The large number of installed instruments in today's mill make the added maintenance of instruments caused by the use of moist and oily air prohibitive.

An instrument air system will reduce instrument maintenance by at least 20 per cent and frequently much more. The reason for this reduction is that the oil and moisture (and accompanying rust and scale) present in mill air damages many of the instrument components. For example, oil attacks the rubber diaphragms and seals in instruments and control valves and reduces their service life to a fraction of what can be expected with oil-free air. Instruments using moist air that are exposed to freezing conditions will not only become inoperative from ice plugging their internals, but will frequently be damaged by the freezing.

A satisfactory instrument air system should be composed of the following:

(1) A suction filter for the compressor.
(2) An oil-free compressor (usually a carbon ring reciprocating compressor).
(3) An aftercooler with moisture separator and automatic drain trap.
(4) A moist air receiver with an automatic drain trap.
(5) An automatic regeneration desiccant type air dryer that will dry the necessary quantity of air to at least minus 20°F dew point. A lower dew point may be required in very cold climates.
(6) A dry air receiver.
(7) An instrument air distribution piping system.

The instrument air piping system should be constructed of materials that will not contaminate the clean dry air supplied by the compressor and air dryer, and care should be exercised to keep dirt and foreign matter out of the system during construction.

The most satisfactory material for an instrument air distribution system for sizes ½ in. and larger is copper water tube with soldered fittings and joints. For sizes under ½ in., soft copper tubing and compression type tubing fittings should be used. A more detailed discussion of instrument tubing in sizes under ½ in. will be included in a later article.

Galvanized steel pipe with galvanized malleable iron fittings can be used for instrument air service, but the great number of screwed joints presents a great increase in the chances of leaks.

Process steam

The piping system for distributing and controlling steam to the various points of use throughout a mill is of prime importance. It must be adequate to take care of widely varying process demands; it must be dependable and safe. Valving should be arranged to allow isolation of sections for maintenance or alterations. Adequate flexibility must be provided to prevent overstress in pipe, valves or fittings and to prevent excessive forces being exerted on connecting equipment. Where process steam is being supplied by turbine extraction or exhaust that requires desuperheating, the piping should be flexible enough to allow for the maximum temperature in case of desuperheater failure.

Steam lines of approximately 50 psi should be designed for a maximum velocity of about 6000 fpm, and those of approximately 150 psi should be designed for a maximum of about 8000 fpm. Adequate pockets should be provided to take care of dirt and scale, and lines should be trapped to remove any collections of condensate.

For nearly all paper mill process steam piping, carbon steel pipe and fittings answer all the requirements adequately and economically. Butt welded pipe and fittings are commonly used in the larger sizes with forged steel screwed or socket weld fittings being used on the smaller sizes.

Valves for pressures under 50 psi are generally cast iron, bronze trimmed for sizes 2½ in. and larger and all bronze for size 2 in. and under. For pressures above 50 pounds, cast steel valves, trimmed with stainless steel and having the proper pressure and temperature rating, are recommended for sizes 2½ in. and up. For sizes 2 in. and under all bronze or forged steel body, stainless steel trimmed valves should be used, depending on the pressure requirements.

Condensate

A mill's condensate system, like its steam system, must be designed to handle large peaks of load, particularly at start-up.

The same general rules governing steam lines apply to condensate lines. The possibilities of exposure to extraordinarily high temperatures and pressures should be kept in mind. In addition, problems of flashing and consequent hammer due to improper mixing of condensate from various sources and line pressure changes must be considered.

For the larger condensate lines, butt welded carbon steel pipe and fittings provide the most satisfactory and economical solution. For the smaller lines at lower pressures screwed pipe with cast iron fittings are generally used. At higher pressures forged steel screwed or socket weld fittings are required.

Drinking water

The requirements of a potable water system are simple but extremely important. The supply must be pure, adequate, free from the possibility of accidental contamination and must not use any material that will impart a taste.

The above requirements are adequately met by either galvanized steel pipe using screwed galvanized malleable iron fittings or by copper water tube with solder fittings, the galvanized system being the cheapest.

Floor drains

The spacing of floor drains varies widely depending on their location in the mill. General practice, however, is to use either a 4- or 6-in. size depending on the severity of the service or mill preference. The overwhelming majority of the floor drains systems used in modern mills is constructed of welded black steel pipe. For a few applications where concentrated chemicals are present, Duriron or other chemical-resistant pipe may be required.

Probably the most important considerations in floor drain piping are proper sloping and fabrication to minimize clogging and sufficient cleanout points in case clogging does occur. Horizontal runs should be sloped as much as practical, and nozzle connections into the downcomer should be made at approximately 45° or more. Cleanout points, consisting of a flanged nozzle covered by a blind flange or a threaded nozzle and cap, would be provided at the ends of long runs or abrupt changes in direction.

Close-up of one of the feed conveyors. The troughed single-strand chain conveyors handle 50 cords of logs per hour.

Gigantic log- and chip-handling system serves Abitibi's new Alpena mill

ROBERT E. PLACE
Chief Engineer, Planet Corp.

The system includes two single-strand feed conveyors of 25 cords/hr. capacity each and two unique fall-out stations that automatically prevent jamming.

AN IMPORTANT INSTALLATION at Abitibi Corp.'s new hardboard-insulation board mill at Alpena, Mich., is the log- and chip-handling equipment. This gigantic 1300-ft. system, which is operated by only five men, delivers 50 cords of pulpwood per hour from the woodyard, through the barking and chipping operations to the chip storage silos.

The mill, located on the shores of Lake Huron, entered full production in the early spring. It is the only mill in the United States making two kinds of hardboard and insulation board under the same roof and is expected to produce more than 200,000,000 sq. ft. of board annually.

Wood in continuous flow

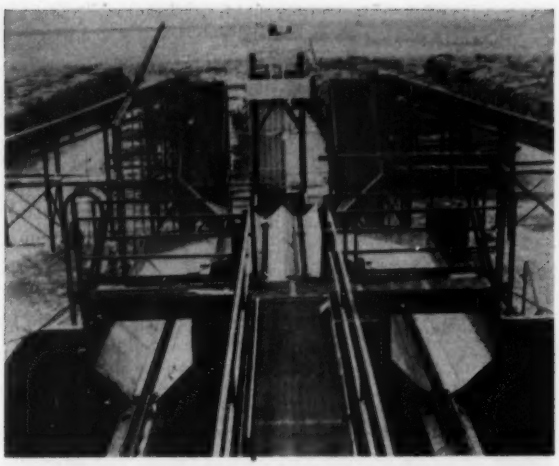
The log-handling system is unique because it eliminates jamming. Officials of Abitibi say that this ingenious system will assure a continuous flow of wood—from woodyard to chip storage silos—for the pulp operation. The entire log- and chip-handling system was installed by Planet Corp. of Lansing, Mich. It was designed by Abitibi and Planet engineers working in close cooperation. Stone & Webster Engineering Corp. directed the over-all mill construction.

Logs for the multi-million dollar mill are brought in by truck or rail in 100-in. lengths. They are procured from three forest districts located within a 100-mile radius of the mill site. When the logs reach the woodyard, the different species are piled in alternated tiers of three different types: pine and other conifers, poplar and mixed hardwoods. A two-month supply is normally kept at the mill.

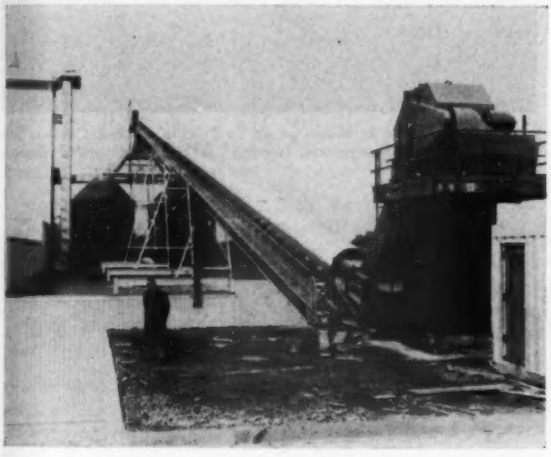
From this point, the log- and chip-handling system comes into play.

The logs—¾ of a cord at a time—are transported by Cary-Lifts (Pettibone-Mulliken Corp.) from the storage tiers to the feed conveyors. Actually, the system, from the woodyard to the barkers, is double. Logs are conveyed from opposite ends of the woodyard on two troughed single-strand chain conveyors. Each feed conveyor has a 25-cord per hour capacity.

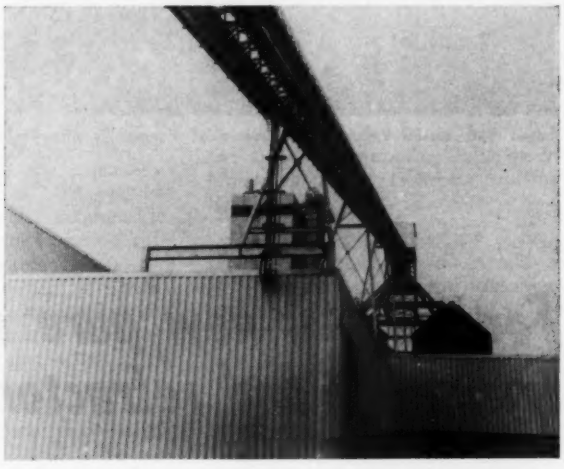
Logs are loaded, ¾ of a cord at a time, by Cary-Lifts into the feed conveyors.



The unique fall-out stations, lower left and right, prevent jamming.



The covered belt conveyor extends 343 ft. from the chipper house to chip storage silos.



The ⅝-in. chips are fed into any one of the four 140-cord storage silos by means of bifurcated valves.

The 100-in. logs remain on the dual lines through the log wash operations, fall-out stations, inspection stations and barkers.

Traveling from opposite ends of the woodyard toward the system's control house, the logs are transported on the feed conveyors at ground level for distances of up to 192 ft. At a point that is 154 ft. from either side of the control house, the conveyors gradually elevate the logs to a height of 25 ft. Next to the control house the logs are dropped off the feed conveyors onto free-fall 90-degree turn chutes.

From the chutes the logs drop onto other troughed single-chain conveyors. While on these conveyors, they are again raised and at the same time carried through the log wash stations. At the top of the incline the logs arrive at the fall-out stations.

Fall-out stations unique

The fall-out stations are the unique feature of the system. They prevent jamming by automatically arranging the logs on the conveyors into single file. This is accomplished by dropping excess logs off the main-line conveyors onto re-circulating conveyors, which feed the dropped logs back into the system thus assuring an uninterrupted flow to the barkers.

The design of the fall-out stations is the essence of simplicity. The logs are carried into a fall-out station on the single-chain conveyor. Here, the sides of the conveyor have been cut away allowing logs piled on one another, or those not squarely on the chain, to fall down a chute by the force of gravity. They are then deposited on a re-circulating conveyor. A chute arrangement discharges the re-circulated logs back onto the main conveyor 85 ft. behind the fall-out station.

After the fall-out station, the conveyors are again troughed and transport the logs past an oversize log reject station into the barker house, where automatic log-centering devices feed them to the mechanical Soderhamn Machine Mfg. Co. barkers with 20-in. diameter capacity. The barkers, which are mounted on rails, can be moved off the conveyor lines, thereby allowing logs with bark to reach the chipper. When the barkers are not in

(Continued on Page 369)

Fused and closed cellular construction of Foamsil is effectively shown.

Foamsil is available in blocks of up to 3 in. in thickness and in prefabricated curved segments, wedge shapes and other designs.

Foamsil — a new pure silica insulating and refractory material

PITTSBURGH CORNING Corp. has succeeded in causing pure silica to boil and foam—and in so doing has created an entirely new acid-resistant insulating and refractory material.

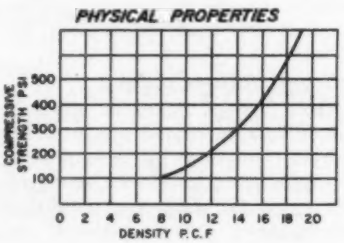
The material, called Foamsil, has a wide range of applications in the chemical and chemical process industries. It is 99 per cent pure fused silica, can neither oxidize nor absorb moisture and is unaffected by all acids with the exception of hydrofluoric and hot phosphoric.

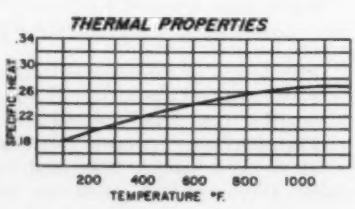
Foamsil is now being produced in quantity at the company's Sedalia, Mo. plant in a special continuous horizontal electric furnace. The furnace, said to be the first of its kind, was built to the company's specifications.

The pure silica, activated by a foaming agent, foams into millions of tiny, non-interconnecting bubbles. When cooled, a lightweight, rigid, inorganic block with a closed cell structure results.

Properties of Foamsil

The material offers continuous insulating protection and withstands thermal shock within the range of −450°F to 220°F. The insulating value of 1 in. of Foamsil is equivalent to that of 18 in. of acid brick at an operating temperature of 250°F.





The temperature range of the new material, according to Russell Brittingham, company president, is greater than that practical for any other insulating or refractory material currently available to industry.

The dimensional stability of the material is exceptional. It does not warp, shrink or slump during rapid temperature changes. When subjected to intense heat (such as that of a steel-cutting oxyacetylene torch) and then water-quenched, it does not crack or spall.

A low expansion coefficient of 3.5×10^{-7}, about one-eighteenth that of low carbon steel, gives the material volume stability throughout its entire temperature operating range. For operating temperatures up to 2200°F,

Foamsil* Fact Sheet

Name of Material:	FOAMSIL
Composition:	99% silica
Form:	Rigid block of cellular structure 11" × 17", 17" × 22" Thicknesses to 3" Insulation (internal and external), curved segments, fitting covers, other shapes
Properties:	None. Any weight gained by immersion is due to wetting of cellular face
Absorption:	7.0
pH:	0
Capillarity:	
Coefficient of expansion:	.00000035/°F (3.5×10^{-7})
Combustibility:	Incombustible
Compressive strength:	130 to 210 lb./sq. in.
Density:	10 to 12 lb./cu. ft.
Flexural strength:	120 to 150 lb./sq. in.
Hygroscopicity:	No increase in weight
Modulus of elasticity:	200,000 lb./sq. in. (approximately)
Resistance to acids:	Resistant to all acids except hydrofluoric and hot phosphoric
Resistance to caustics:	Should be protected.
Resistance to abrasion:	Should be protected.
Specific gravity:	.16 to .19
Specific heat:	100°F .18; 500°F .235; 900°F .265; 1200°F .277
Thermal conductivity for 11# density K = BTU/sq. ft./hr./°F/in.	Temperature — K 100°F — .48 500°F — 1.0 900°F — 1.85
Thermal shock resistance:	Excellent
Temperature limits:	Cyclic—450°F to 1600°F; Continuous—2200°F
Permeability:	0
Dielectric constant relative to air	1.35

*FOAMSIL is a registered trademark of Pittsburgh Corning Corp.

Foamsil actually expands, whereas most insulations shrink. It has been heated in a furnace at 1600°F for more than two years without any evidence of deterioration. This feature reduces the need for expansion joints and vertical clearances and virtually eliminates joint separations due to expansion and contraction.

Light in weight (10 to 12 lb. per cu. ft.) and with a compressive strength of 130 to 210 lb. per sq. in., Foamsil can be used as a load-bearing surface to eliminate some of the supporting and reinforcing structure required with conventional material.

The material is available in block sizes of 11 × 17 in., 17 × 22 in., and up to 3 in. thick. Greater thicknesses may be obtained by laminating. Approximate cost of the material is 50c per board foot.

Applications of Foamsil

Laboratory and industrial applications show Foamsil to be ideal as a lining inside tanks and pipelines that contain hot acids of any concentrations. The sealed silica cells prevent absorption of the acids, inflammable solvents or vapors, thus assuring full original insulating value throughout the life of the equipment it serves. Because of the absence of capillary action, Foamsil also cannot act as a wick for transfer of inflammable liquid or gas to critical areas.

Concrete, brick or steel stacks subjected to corrosive atmospheres may be readily lined with the lightweight acid-resistant material. It can likewise be used as underground thermal and electrical insulation.

In addition, its dielectric constant of 1.155 and loss tangent of .003 (9.4 lb. per cu. ft. density at 9400 MC/sec. and 26°C) promises value in the high-temperature electrical insulation field.

Possible uses for this new material have been suggested in: Absorbing towers, bleach towers and vats, black liquor evaporators, accumulators, recovery furnaces, cyclone evaporators, electrostatic precipitators, smoke stacks on recovery furnaces, acid-proof linings for concrete tanks, acid storage tanks, etc.

Abitibi's chip-handling system

(Continued from Page 367)

position, removable conveyors fill the gap.

Bark that has been stripped off the logs drops into a hopper feeding a bark hog. From the bark hog, a belt conveyor with a capacity of 5/400 cu. ft./hr. carries the shredded bark to special truck body receptacles. The bark is used as a secondary fuel in the mill's power plant.

Holdback prevents jamming

While still in the barker house, the debarked logs emerge from the dual lines onto a powered spike-roller conveyor, which carries them to the chipper. This conveyor has a holdback unit that prevents jamming in the chipper feed spout by holding back one log when the sum of the two logs exceeds 20 in. The holdback unit, a series of lift arms that raise between the rollers, is manually-operated by an air cylinder.

A maximum of 50 cords of logs per hour pass into the 12-knife Norman (Carthage Machine Co.) 96-in. chipper, where they are reduced to 5/8-in. chips. The chips are collected beneath the chipper on a belt conveyor that transports them to a bucket elevator. The bucket elevator lifts the chips to the roof of the chipper house and deposits them onto an overhead belt conveyor. This 344-ft. troughed belt conveyor is shielded from the elements with watertight removable aluminum covers. It carries the chips across the mill building roof to four chip silos, each having a capacity of 140 cords.

The chips can be fed to any one of the four storage silos, each of which holds a different wood species, by means of bifurcated valves. The chips can be released from the bottom of any of the silos individually or in any combination, thus making possible any blend. As the chips are dispensed from the silos, they are fed by rotary plate feeders at a rate of 2500 cu. ft./hr. onto a system consisting of six belt conveyors for delivery to one of three bucket elevators supplying the pulping operation.

Only five operators are required to work the entire log- and chip-handling system. Two drive the Cary-Lifts that supply the logs, one regulates the woodyard conveyor from the centrally-located control house, one supervises the barking and chipping operation, and one directs the flow of chips into and out of the silos.

Cypak control for wood chip chemical digester systems*

WESLEY A. ROTH
Westinghouse Electric Corp.

▶ Cypak controls, or static switching circuits, are relay controls with no moving parts. They consist of such basic elements as carbon resistors, magnetic cores and silicon or selenium rectifiers.

CYPAK CONTROL WAS first used to automatically control a Bauer Bros. Co. rapid cycle digester. To date, Westinghouse has built five such digester control systems and has four more under consideration for the near future. The first application of Cypak or any other static control to a digester was a coordinated effort involving Foxboro Co., Bauer Bros., Bowaters Southern Paper Corp. and Westinghouse. Foxboro provided the control cubicle with graphic flow diagram and instruments and Westinghouse the Cypak control on two open panels for inclusion in this cubicle.

Cypak

Cypak is the Westinghouse tradename for static switching circuits to be used in industrial control applications. In much simpler terms, they are relay controls with no moving parts. There are no relay contacts to pit, corrode or wear out and no moving armatures to require maintenance after excessive use. Because Cypak is a mechanically static device, the number of operations has no effect on the life of the unit itself. Cypak devices consist of such basic elements as carbon resistors, magnetic cores and silicon or selenium rectifiers. The rectifiers are subject to aging, but are being used at about 1/3 of their rated capacity to insure long life. The control life of any Cypak unit is anticipated for between 10 and 20 years. Cypak devices are encapsulated plug-in devices that are impervious to corrosive atmospheres, hazardous dusts and vapors. They are ideally suited for the paper and pulp and the chemical industries where such hazardous conditions exist. In summary, Cypak, because of its static nature, presents the ultimate in reliability and trouble-free control operation with a lower lifetime cost for the user.

Cypak component operation

Most Cypak devices are based on the development of the Ramey** circuit, which provides a fast-response magnetic amplifier. This fast response time, namely ½ cycle delay on a 60-cycle-per-second time basis, makes feasible the application of static units to switching applications to replace relays. The grain-orientated, magnetic, nickel-iron alloy core provides a very near square historesis loop with a sharp saturation point and sharp switching action. When using this magnetic material in the circuit shown in Fig. 1 and applying AC voltage Eg, current Ig will flow through the coil when Terminal A is positive. With proper values of Eg and N (turns of coil), Ig will be just sufficient to drive the core to saturation during this positive one-half cycle. In the next negative one-half cycle, the rectifier CR1 prevents flow of current. At the start of the next positive half cycle, the core remains saturated, and since it cannot absorb any more voltage, there will result a voltage across load Rg.

In the Ramey circuit (Fig. 2) a second winding of Nr turns is added to the Magnetic core and a resistor Rr so that Er will drive the core to saturation during one-half cycle. However, the rectifier CR2 and the polarity of the Er are arranged so that the second winding will drive the core to a negative saturation during the half-cycle that current flows. During the first half-cycle, called the gating half

*Presented at the American Institute of Electrical Engineers' Pulp & Paper Conference at Raleigh, N. C., March 27-29.

**R. A. Ramey — Westinghouse Electric Corp.

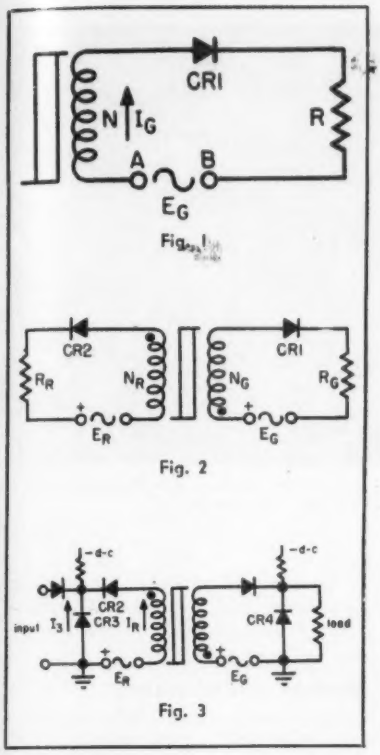


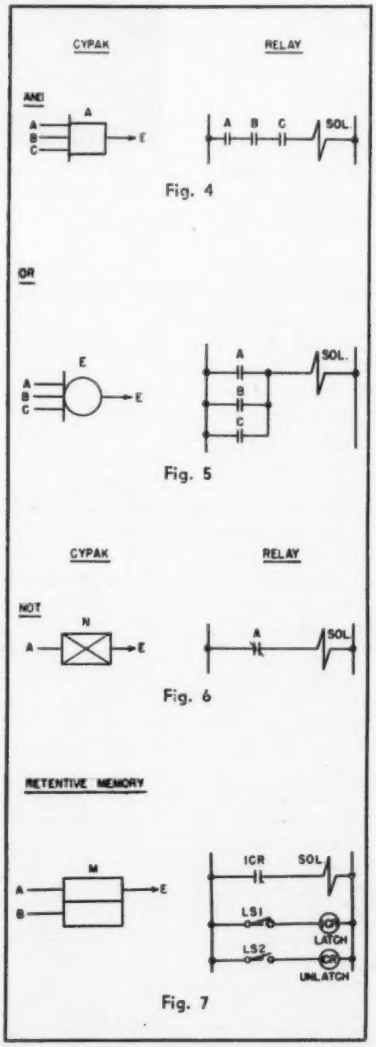
Fig. 3

cycle, the voltage Eg drives the core to a positive saturation. During this cycle, the flow of current in Nr, called the reset, is blocked by rectifier CR2. During the next half-cycle current in the gate circuit is blocked by rectifier CR1, but voltage Er in the reset circuit drives the core to negative saturation. With continued application of the Eg and the Er the core will oscillate between positive and negative saturation, and there will be virtually no output to the load Rg.

The output of this system can be controlled if the reset voltage Er is absent for one-half cycle. As described above, an output will appear across the load resistance on the next gating half-cycle if we prevent the resetting of this core. This is accomplished by the circuit as shown in Fig. 3. Bias DC voltages have been introduced to both the gating and reset circuits. The reset circuit DC is applied so that the current 13 through rectifier CR3 is larger than Ir. Consequently, CR3 presents a low impedance to Ir, which flows through it and accomplishes reset of the core. When an input voltage greater than Er is applied, the current in rectifier CR3 tends to drop to zero, and the effective impedance of CR3 becomes a backward resistance of a very high value. Rectifiers CR2 and CR3 are blocked, reset current cannot flow, and the output appears across the load on the next half-cycle. This circuit, as described, provides a one-input AND element. That is, one input to the element will produce an output.

Static control functions

Static control systems consist of a number of devices, all of which perform a particular function but a combination of which will perform all the functions of control relays. The first device performs what is called the AND function and would operate



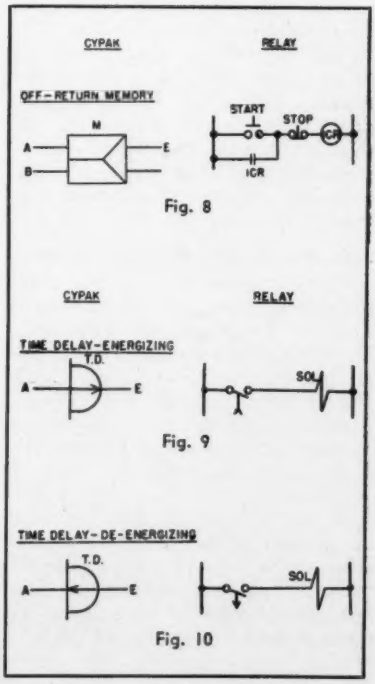
only if all inputs were energized. In reference to Fig. 4, this would mean that inputs A, B and C would have to be energized before there would be an output E. This would be analogous to a number of contacts in series that would have to be closed in order to obtain a potential across them. Inputs are any electrical signal from a sensing device such as a pushbutton, limit switch, instrument or float switch. Outputs are the electrical signals from the static control modules that are used to operate other modules, solenoids, linestarters and valves.

A second device performs what is called the OR function and would operate if any input were energized. With reference to Fig. 5, this would mean that, if either signals A or B or C were energized, there would be an output E. This is analogous to a number of contacts in parallel where, if any one of these is closed, a potential across them all would be produced. This module is used primarily as a means of isolating electrical signals and to prevent "sneak" feedback circuits.

A third device performs what is called the NOT function and would produce an output if no input were energized, and no output if an input were energized. With reference to Fig. 6, the absence of input A would produce an output E; but if an input A were energized, there would be no output E. This would be analogous to a normally closed contact in a circuit where, if this contact were opened, there would be no potential across it.

A fourth device performs what is called the Retentive Memory function and is a device that retains a condition of output corresponding to the input last energized. In reference to Fig. 7, once an input A is energized, an output C is produced that would remain whether or not A does and can only be turned off by energizing input B. This would be analogous to a mechanically latched-in relay.

(Turn to Page 368)



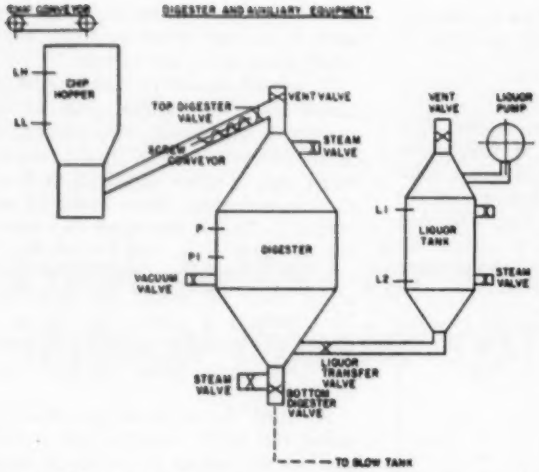


Fig. 11—Chip bin, digester, liquor and blow tanks are controlled by Cypak at Jujo Paper Co.

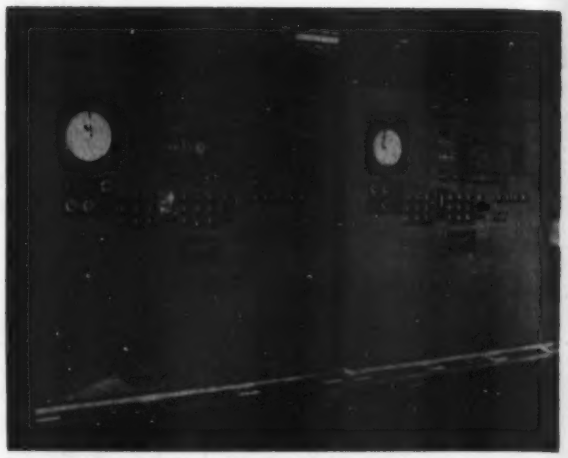


Fig. 12—A complete graphic flow diagram with indicating lights, pushbuttons, selector switches and instruments.

A fifth device performs an Off-Return Memory function and is a device that retains the condition of output corresponding to the input last energized, except upon interruption of power it returns to the off condition. This module is analogous to a low-voltage protection circuit. Reference Fig. 8.

A sixth device performs a Time Delay on energizing function. This module is a device that, after receiving an input, will have some definite time delay and then produce an output. In reference to Fig. 9, this would mean that after input A was received, there would be some time delay, then output E would exist.

A seventh device performs a Time Delay on de-energizing function. This module is a device whose output is de-energized following a definite intentional time delay after its input is de-energized. In reference to Fig. 10, this would mean that after input A is de-energized, there would be some time delay, then output E would be removed.

Jujo Paper Co. digester control

Fig. 11 shows in simplified form the digester along with the associated chip bin, liquor tank and blow tank, all of which are controlled by Cypak at Jujo Paper Co. in Japan. Cypak automatically controls this digester process by opening and closing motor-operated valves in proper sequence dependent on process variables such as temperature, pressure and time. Cypak does not meter any of these variables, but instead utilizes electrical signals from conventional sensing devices such as the instruments and float switches in order to control the sequencing and interlocking of this system.

Fig. 12 shows a view of the control cubicle, which is finished gray on the outside and white inside. The dimensions of the cubicle are 81 in. long × 76 in. high and 26 in. deep. On the front of the enclosure is a complete colored plastic graphic flow diagram of the system with indicating lights for visual indication of the process in sequence. Pushbuttons, selector switches and instruments are placed throughout this flow chart so that all or part of the system can be operated either manually or automatically. In the rear of this cabinet are two indicating lights and a test probe, which comprises a built-in phase tester for checking the Cypak modules in event of failure. The cabinet also includes the various pressure switches and the static control mounted on two panels.

All of the air valves are equipped with limit switches to indicate their relative position. A valve in the closed position is indicated by a green light on the graphic panel, and a valve in the open position is shown by a red light. All of these valves are normally closed on air or electrical failure except the vent valve, which relieves digester pressure. In this manner, the complete system will go to "Off" position, and the cycle must be finished manually. All of the valves are opened or closed by magnetically-controlled solenoid air valves or by the Pressure Indicator Controller. The cycle may be started automatically by returning all of the individual switches for the valves, pumps and conveyor to the automatic position and then turning the digester master "auto-off-manual" switch to the "auto" position. At any time during the automatic cycle, the digester may be stopped by turning either the master or the individual valve "auto-off-manual" switch to the "off" position.

Neutral sulfite cycle

The Bauer rapid cycle digesters have two basic cycles, namely, cold caustic soda and neutral sulfite. The neutral sulfite cycle will be described in detail now.

The following pre-conditions exist prior to starting in the neutral sulfite cycle:

1. Master "auto-off-manual" switch in "off" position for digester.
2. Steam valve — closed.
3. Digester vent valve — open.
4. Liquor transfer valve — closed.
5. Digester top valve — closed.
6. Blow valve — closed.
7. Vacuum valve — closed.
8. Liquor refill pump — off.
9. Digester pressure booster pump — off.
10. Digester feed conveyor — stop.
11. Elevator conveyor — stop.
12. Sulfite-soda selector switch in "sulfite" position.
    Hand valve closed on air — hand valve open on steam.
    Hand valve closed at caustic soda storage — hand valve open at sulfite storage tank.

Loading cycle

The master selector switch is turned to the "automatic" position, and the "auto-cycle-start" pushbutton is depressed. At this time the elevator conveyor starts operating to fill the chip-measuring bin to high level. Also, the liquor refill pump is actuated to start filling the liquor tank to the high level, providing the liquor transfer valve is closed. The digester top valve will open providing the steam valve, liquor transfer valve, blow valve, vac-

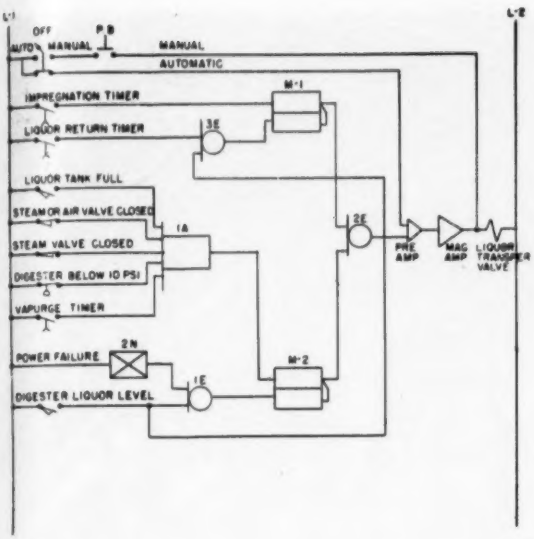


Fig. 13—An example of how static control operates the liquor transfer valve.

uum valve are closed, and the digester vent valve is open. When the top valve is fully opened as indicated by a limit switch, a 0-to-5-min. timer starts concurrently with the feeder conveyor from the chip bin to load chips into the digester. When this timer indicates that enough chips have been put into the digester, the feeder conveyor is stopped and the top digester valve closed.

Vapurge (pre-steam) cycle

After the top digester valve is closed, another timer is actuated, a steam valve is opened and immediately goes on the control of the Pressure Indicator Controller instrument. Next, the timer times out and the vent valve closes. Pressure in the digester increases to a pre-set pressure as indicated by a pressure switch. At this point, a third timer is actuated to time the period of the pre-steaming of these chips at a constant or near-constant pressure. When this timer times out, the steam valve closes and the digester vent valve opens as the pressure rapidly drops to 10 psi.

Filling cycle

When 10 psi is reached as indicated by a pressure switch, the liquor transfer valve will open and the neutral sulfite liquor will be transferred to the digester. A high digester level indicator closes both the digester vent and liquor transfer valves.

Impregnation cycle

Now that both the liquor and chips are in the digester, the steam valve will open to bring the pressure in the digester up to a specific level for a specific length of time. After this timing period, the chips have been impregnated with liquor, and the liquor transfer valve opens to return the remaining liquor to the liquor tank.

Cooking cycle

When the liquor transfer valve closes, a timer is started to time the cooking period. A steam valve is continually throttled by the Pressure Indicator Controller to maintain a pressure level throughout the cook cycle. After a specified time, the steam valve is closed and the vent valve opens, reducing the pressure somewhat for blowing. At this specific blowing pressure, the vent valve is closed and the blowing cycle starts.

Blowing cycle

The blow valve opens at this point and the material is blown from the digester (timed period), after which the blow valve closes and the vent valve opens. The digester is now ready for a repeat cycle.

Liquor transfer valve

A specific example of how static control operates the liquor transfer valve will now be described (Fig. 13):

1. This valve may be operated manually by placing the master selector switch in the "manual" position and depressing the manual liquor transfer valve pushbutton.
2. This valve is operated automatically by two means:

   a) When the liquor tank is full, steam valves closed, vapurge timer timed out, and the digester pressure below 10 psi, AND module 1A will have an output. The liquor transfer valve will open only if all of the above preconditions are satisfied as indicated by five inputs to module 1A. The output from AND module 1A operates Memory module M-2, which in turn opens the liquor transfer valve via OR module 2-E, pre-amplifier module and the magnetic amplifier. This valve will close when the digester liquor level switch closes to indicate that sufficient liquor is in digester. The digester liquor level switch sends a signal into the "off" side of Memory module M-2 to remove signal to valve, which then returns to normal closed position.

   b) When the impregnation timer has timed out, indicating that chips have absorbed enough liquor, a signal is fed into Memory M-1, which opens valve to return excess liquor to liquor storage tank. The amount of liquor to be returned is timed with another timer that sends a signal into the "off" side of Memory M-1 to close valve.

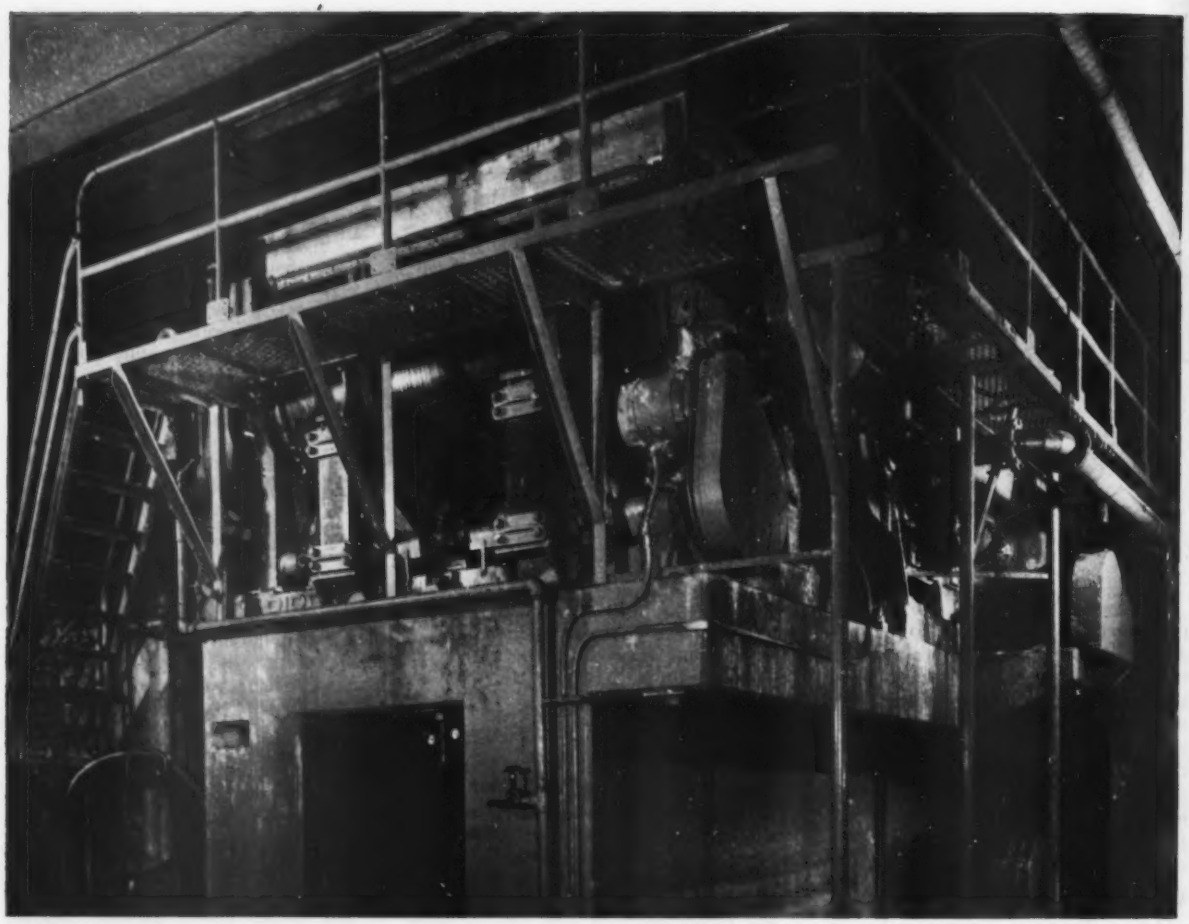
In case of a power failure during any part of this cycle, NOT module 2N turns Memories M-1 and M-2 to "off" position to demand that the operator finish process manually.

Summary

Cypak modules perform electrical switching, interlocking and sequencing functions, of which there are many on this particular digester control application. However, static control is most frequently used on applications where the repetitive operation of the relays are the main factor rather than the complicated sequencing and interlocking. On many machine tool applications, the relays literally "bank" themselves to death in a very short period of time due to repetitive operation. This, however, is not the general problem with a digester in that the duty cycle is not as severe.

As stated previously, the advantages of Cypak control for this particular application are a result of the static nature of the components. The encapsulated modules are impervious to corrosive atmospheres such as sulfite. The corrosive atmosphere would undoubtedly cause considerable relay trouble due to the pitting and corroding of contacts. The more expensive static control will provide reliable, maintenance-free operation and can be justified economically on this application when comparing the slight increase in the control price versus the cost of the complete digester system.

Westinghouse is of the opinion that Cypak can be used to a definite advantage on digester control systems. Cypak should be considered wherever the user is experiencing trouble or contemplating the purchase of new digester systems.



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Big, modern Bird Screens guard against rejects and shutdowns by removing dirt and foreign matter from the stock just before it flows onto the machine wire.

They deliver the stock uniform in weight, free of lumps, strings and slime — stock with the fibres combed out and individualized to assure good formation — stock that contains nothing that can do damage to delicate machine wires or scratch polished roll surfaces.

Regardless of what other dirt removal methods and equipment you employ, Bird Screens belong at the head of *your* paper machine.

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BIRD SCREENS

CURRENT COMMENTS

Not to Canada's disadvantage . . . a definite upturn . . . and Scott free

by WARREN B. BULLOCK

President Eisenhower's July visit for economic consultations with the Canadian government may result in permission for Canadian companies that are subsidiaries of United States corporations to ship paper and pulp to Red China. Such shipments cannot be made by United States mills under Washington regulations.

One major complaint by the Canadian authorities was based on the inability of Ford Co. of Canada to fill a 1000-car order from China because of restrictions by United States Ford. No official announcement of the terms of any agreement between the two governments on such transactions has been issued, but Prime Minister Diefenbaker has stated that, "the President expressed the view that the United States regulations should not be applied in any way to the disadvantage of the Canadian economy."

Paper and pulp come into the picture through the inability of a prospective exporter to Red China to secure quotations on shipments of Canadian bleached sulfite pulp from either Rayonier or Crown Zellerbach of Canada. Whether the discussions between Eisenhower and Diefenbaker will alter the picture is yet to be spelled out, but apparently a concession to Canadian wishes has been reached.

The price squeeze

Analysis of income reports of various paper companies for the first half of 1958 gives definite indication of an upturn even though the first half was less profitable than the first half of 1957. Second quarter reports in many instances show an increase over the first quarter, and in a few cases the first half reports are even somewhat higher than in 1957. In almost every case, however, increased dollar sales are not duplicated by net income, the price squeeze being still operative.

Total paper and paperboard production in the first half of 1958 was off only 4.4 per cent from the high figures for 1957, the total tonnage in 1958 being 14,854,000 tons as compared with 15,538,296 tons in 1957. Some students of the packaging industry estimate that the last half of 1958 will see an enormous increase in the usage of corrugating media for shipping containers. They are talking of increases in billions of square feet.

The soft underbelly

While many of the domestic paper mills seem to be regaining their stride after the unsatisfactory conditions of 1957, newsprint continues to be the soft underbelly of the industry. Idle capacity in North America has now reached the million-ton mark, and declines in consumption have amounted to $25,000,000 in the first seven months of 1958. This idle capacity represents a replacement value of $350,000,000, according to the Newsprint Information Committee. American production of 624,236 tons in June was 9.7 per cent below the record high in June of 1957. Mexico, which formerly secured its newsprint from the United States and Canada, is now producing half of its requirements at a mill opened in June and partly financed by United States interests.

Canada's market for newsprint grades will improve through the enactment of a United States bill to allow free entry of rolls of paper 13 in. in width. This bill has already been passed by the lower house of Congress. Hitherto newsprint rolls 15 in. in width were the minimum to be allowed duty-free entry. The narrower rolls are used for salesbooks and miscellaneous printing, and for the few newpapers that print tabloid editions in such sizes.

Notes on an industry

Albemarle Paper plans increased financing to a total of $15,000,000. Of this sum, $6,500,000 will be used to install a new paper machine at Roanoke Rapids, N.C., and $6,500,000 to retire outstanding 4¾ per cent bonds. Stockholders will be allowed to subscribe for $3,500,000 in 5½ per cent convertible debentures, and a group of underwriters and insurance companies will provide the balance of the desired funds.

Allied Paper of Chicago has announced that American Linen Supply will exercise its option to purchase the nine-machine mill of Allied-Albany Paper for $1,500,000. Allied-Albany has called for redemption as of August 29, 1958, the entire issue of bonds of the old A.P.W. Paper at 101 per cent of the face value. The last reported sale of these bonds on the New York Stock Exchange was in July 1958 at 91½.

Negotiations for the sale and reopening of Whiting Paper of Holyoke, Mass., will be concluded if approved by the company's creditors. New England Associates is the prospective purchaser.

One United States paper company is expanding into Australia, while another has decided against a move to Latin America. Lily-Tulip has reached an agreement with an Australian company to produce a comprehensive line of Lily-Tulip products just as its similar affiliates are producing such lines in England and New Zealand. On the other hand, the parent company for J. & J. Rogers of Au Sable Forks, N.Y., has agreed to keep the plant in operation in New York instead of moving it to Venezuela.

Scott Paper has been cleared of charges of violation of anti-trust laws by an examiner for the Federal Trade Commission. Scott's acquisition of Soundview Pulp of Everett, Wash., Detroit Sulphite Pulp & Paper of Detroit and Hollingsworth & Whitney of Boston had been challenged as a violation of the anti-trust laws in that such purchases might result in substantial lessening of competition in the sanitary paper products industry.

Financial Reports

The continuing upturn of sentiment as to the nation's economic

Fig. 2108—Monel or Nickel "Y" Valve for 150 pounds W.P. Outside screw rising stem and yoke. Screwed ends. Flanged end or socket welding end valves can be supplied.

AGAIN AVAILABLE!

POWELL NICKEL and MONEL* VALVES

Fig. 2453 SG—Large size O.S. & Y. Gate Valve for 150 pounds W.P. Solid wedge disc. Can also be furnished with split wedge disc. Dimensions conform to latest standards.

Fig. 1836—Monel Metal
Fig. 1839—Nickel
Small Union Bonnet Globe Valve for 200 pounds W.P. Available with screwed, flanged or welding ends; also in angle pattern.

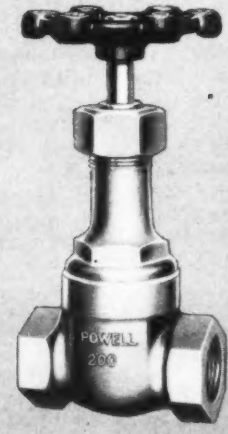
Now that restrictions have been lifted on the manufacture of Nickel and Nickel Alloys, we have produced a wide line of NICKEL and MONEL* METAL VALVES. All are ready for immediate delivery!

When your flow control requirements call for Nickel or Monel* Metal Valves your local Powell Valve Distributor is the man to see. There's one located in all principal cities. Or write to us for complete information.

THE WM. POWELL COMPANY
Cincinnati 22, Ohio
dependable valves since 1846

*Registered Trade Name of The International Nickel Co.

Fig. 1828—Monel Metal
Fig. 1830—Nickel Inside screw rising stem Gate Valve for 200 pounds W.P. Accurately guided solid wedge disc. Also available with flanged or socket weld ends.



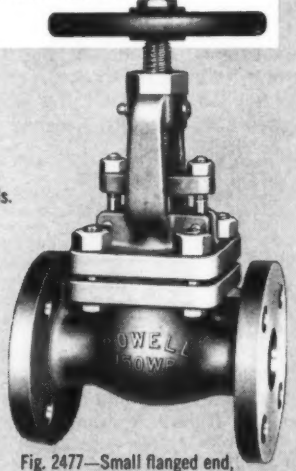


Fig. 1843—Monel Metal. Fig. 1845—Nickel. Small size Check Valve for 200 pounds W.P. Screwed-in cap. Has straightway flow area through valve body when disc is in wide open position. Can also be supplied with flanged or socket weld ends.

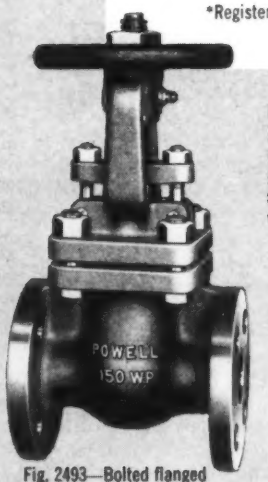


Fig. 2493—Bolted flanged bonnet Gate Valve for 150 pounds W.P. Outside screw stem rises through revolving bushing in upper yoke. Interchangeable solid or split wedge discs. Screwed or socket weld end valves also available.

Fig. 2477—Small flanged end, outside screw rising stem and yoke Globe Valve for 150 pounds W.P. Bolted flanged bonnet. Can be furnished with screwed or socket weld ends. Angle Valves available.

Current Comments . . .

future continued to be shown by security prices during July, the general trend for paper mill issues keeping a reasonably parallel pace with the upward surge of metals and other key industries.

Net Incomes

National Vulcanized Fibre Co.—First quarter, $91,700; a year ago, $203,505.

Nekoosa-Edwards Paper Co.—For the March quarter, $564,668; a year ago, $975,221.

Oxford Paper Co.—For the first quarter, $669,998; a year ago, $960,469.

Riegel Paper Corp.—For 13 weeks ended April 1, $796,908; a year ago, $709,139.

Sorg Paper Co.—For the March quarter, $101,708; a year ago, $143,022.

West Virginia Pulp & Paper Co.—For the six months ended April 30, $4,683,000; for the comparable period in the preceding fiscal year, $6,133,000.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Aug. 1, 1958	July 10, 1958
American Can	47⅞	49½
Celotex	32⅜	31
Same Pref.	* 18-18½	* 18½-19⅛
Certain-Teed	10½	10
Champion P & F	41⅜	40⅛
Same Pref.	97¼	98
Chesapeake Corp.	30¾	31
Container Corp.	24	22
Same Pref.	* 94-98	* 93-96
Continental Can	49⅜	51¼
Crown Zellerbach	51¼	48½
Same Pref.	98¾	*100-101
Diamond Gardner	32	32
Same Pref.	31½	32
Eastern Corp.	37¾	36
Federal Paper Board	42⅜	38½
Same Pref.	21¾	21⅞
Fibre Paperboard	32¾	29¼
Same Pref.	109	102
Great Northern	48¾	46⅝
Hammermill	30½	23⅜
International	103⅜	101½
Same Pref.	* 92½-93½	95
Kimberly-Clark	57½	56⅛
MacAndrews & Forbes	27¼	* 26¾-27¼
Masonite	34	31¾
Mead Corp.	41½	37
Same Pref.	* 94-95½	* 94-95½
Minnesota & Ontario	29	28
Oxford Paper	33½	33½
Same Pref.	* 94½-96½	* 93½-95
Rayonier	20⅝	16⅞
Riegel Paper	30	27¼
St. Regis	36⅝	34¾
Same Pref.	* 96-98	95
Scott Paper	67	67
Same $4 Pref.	* 97-95	96
Same $3.40 Pref.	* 83-85	84
Sealright	35½	34
Sutherland	38⅜	38
Union Bag-Camp.	37⅜	34
United B. & C.	25	22½
United Wallpaper	6⅝	* 6⅛-7
Same Pref.	* 13¼-15	* 14-15⅜
U. S. Gypsum	86¾	85
Same Pref.	168	*169½-169
West Virginia P. & P.	40	39¼
Same Pref.	*100-102	*101-102

New York Stock Exchange — Bonds

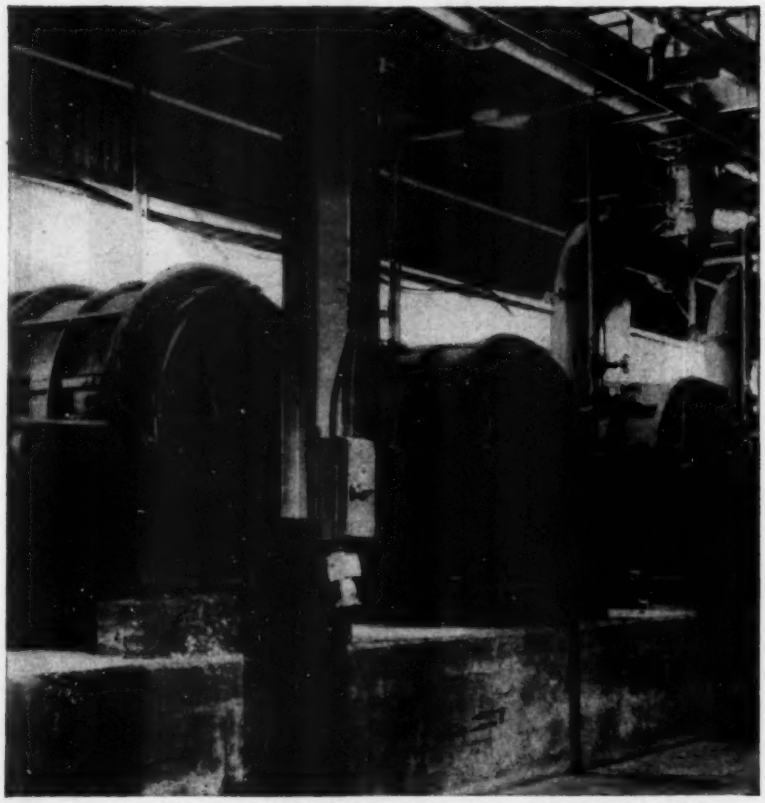
A.P.W. 5%	91⅝	—
Champion P. & F. 3¾%	—	—
Champion P. & F. 3%	—	—
Kimberly-Clark 3¾%	100¼	100
Mead Corp. 3%	—	—
Scott Paper 3%	103	105

American Stock Exchange — Stocks

Allied	9	8⅜
American Writing	24	22
Brown	11½	12⅜
Puget Sound Pulp & Timber	17¼	16½

*Closing Bid and Asked Prices.

What, actually, do Vacuum Pumps on paper machines handle?



Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

NASH ENGINEERING COMPANY

443 WILSON ROAD, SO. NORWALK, CONN.

40% 40% 40%

MORE WATER

can flow through the NEW Layne 134 shutter screen

WHY? *Increased inlet area!*

Here's a screen that is even more efficient . . . has *greater strength* than the long-lasting Layne 96 shutter screen that made Layne water wells famous.

This new development of Layne creative research is used only in Layne water well installations, and available exclusively through Layne Associate Companies.

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WATER WELLS
VERTICAL TURBINE PUMPS • WATER TREATMENT

NEWS of the INDUSTRY

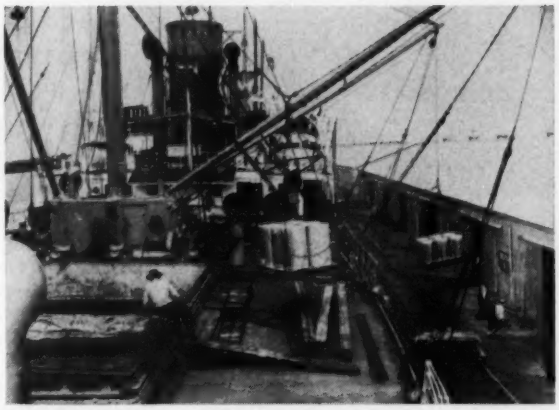
Tall Oil Rosin Goes Overseas

The largest shipment of tall oil rosin ever to move through the Port of Savannah, Ga.—and one of the largest ever handled in this country—was lifted aboard a Philippine ship recently. Its destination: Japan.

The rosin, manufactured at the tall oil distillation plant of Union Bag-Camp Paper Corp. in Savannah, weighed 800 metric tons (1,763,680 lb.) and required the use of 3500 metal drums. Thirty railroad freight cars moved the shipment from plant to shipside.

The tall oil rosin (a by-product of the kraft papermaking process) is pumped into the drums while it is hot and in a fluid state. After it cools, it hardens into a clear amber-colored solid. To remove it from the drums the lightweight metal is simply stripped away.

The Japanese buyers of the record rosin shipment plan to use it in the manufacture of paper sizings, paints, varnishes and synthetic resins.



BOOMS MOVE THE ROSIN—six drums at a time—aboard the "Nonsuco" and into the waiting hold.

$600,000 Structure to House Clay Coater at Blandin Paper

Blandin Paper Co. of Grand Rapids, Minn., will install a new clay coating unit in a $600,000 building now under construction. The 213- by 75-ft. structure has been designed for the future possible installation of three supercalenders if and when a new paper machine is added to the line.

The coater is being supplied by Rice Barton Corp., with certain parts specially designed by Central States Engineering Inc. These include the unwind flying paster and coating heads, which are being built to Blandin specifications.

A General Electric Co. drive will operate the new coater at 3000 fpm; the flying paster has been designed for operation at the same speed. The paper will be dried on a Gardner gas-fired, high-velocity dryer manufactured by Overly's Inc. and distributed to the paper industry by Rice Barton. The coater first coats one side, dries it and then coats and dries the second side in one complete operation.

CZ Plans Cane Tests

The feasibility of manufacturing paper from Hawaiian sugar cane residue will be studied by Crown Zellerbach Corp. in a $600,000 research project.

Facilities for the research and testing are to be constructed at both CZ's central research department in Camas, Wash., and in the Islands. The cost will be shared by the paper manufacturer and the Hawaiian Sugar Planters Association.

Special pulping and refining equipment to prepare sugar cane bagasse for papermaking on standard machines will be developed at Camas. While at the same time a large-scale pilot plant will be constructed in Hawaii to study the depithing of bagasse. The effects of weather on sugar cane residue will also come under investigation.

Further refining will be undertaken at Camas, and for this purpose approximately 1000 tons of the material will be shipped to the States. (Studies have shown that about 1 ton of bagasse is required to produce 1000 lb. of paper.)

Forest Fire Research Lab Under Construction

A forest fire research laboratory —the first of its kind in this country —is being built near Macon, Ga., as a joint undertaking of the United States Forest Service and the State of Georgia. Operation is scheduled for early next year.

The fire research program now underway in the South is "one of the finest examples of state and federal cooperation", Joseph F. Pechanec said in announcing the project. "It is through such joint research that forestry problems will be solved much more quickly than would otherwise be possible." Pechanec is director of the Southeastern Forest Experiment Station at Asheville, N.C.

Fire scientists at the new laboratory will seek to learn more about the natural laws that affect fire in the woods and why fire responds in certain ways to weather and natural fuels. From such knowledge they hope to come up with new and more efficient ways to control forest conflagrations. This part of the work will include special studies in convection, heat transfer and fire physics.

Located at the Georgia Forestry Center, the two-story structure will be equipped with a wind tunnel, controlled temperature and humidity room and other modern physical and chemical research facilities.

Brunswick Completes $3,000,000 Chlorine Dioxide Plant

Brunswick Pulp & Paper Co. has recently completed a $3,000,000 chlorine dioxide plant at Brunswick, Ga. The new unit extends facilities for the manufacture of high-quality pulp

LOOKING TOWARD THE receiving end of the Thermoid white rubber conveyer belt from the top of the incline at Brunswick Pulp & Paper's new chlorine dioxide plant.

for shipment to Scott Paper Co. and Mead Corp., co-owners of the Georgia firm.

A modern conveying system—including a white belt supplied by Thermoid Co.—operates "around the clock". Its daily load approximates 750 tons of bleached finished pulp. The belt is constructed of ⅛- × ⅛-in. covers and is 48 in. wide with four plies. Its color serves to maintain cleanliness and product purity.

Finished bleached pulp is dumped on the receiving end of the belt and is carried up a 184-ft. 45° incline to be dumped into the high-density stock storage chests, from where it is distributed to either of two chests by screw conveyor.

Installed at the dump-off end of the conveyor is a television camera that enables operators in a central control room to maintain constant tab on belt operation. Six such cameras are located throughout the plant.

Special Committee to Study Forest Insect and Disease Control

The forest industries have named a special committee to help plan and coordinate insect and disease control on the nation's 484,000,000 acres of commercial timberlands.

The group, appointed by the Forest Industries Council, is headed by Howard D. Bennett of Cincinnati, secretary-manager of Appalachian Hardwood Manufacturers Inc. Vice chairman is E. F. Heacox of Weyerhaeuser Timber Co.

(The Forest Industries Council is the forest policy coordinating body representing the American Paper & Pulp Association, the National Lumber Manufacturers Association and the American Pulpwood Association.)

James Madden, vice president of Scott Paper Co. and chairman of the council, listed the following committee objectives:

(1) To bring about better understanding, coordination and cooperation among all agencies interested in forest insect and disease control; (2) to survey the forest pest situation throughout the United States; (3) to stimulate interest in and action on forest pest control, and (4) to encourage the formation of state and regional forest pest action committees.

Paper industry representatives on the committee are: George Winter, St. Regis Paper Co.; C. S. Herr, Brown Co.; N. R. Harding, Rome Kraft Co.; R. C. Barienbrock, Mead Corp., and J. B. Millar, Kimberly-Clark Corp.

Unions Plan Merger

Plans for the merger of the International Woodworkers of America and the Brotherhood of Pulp, Sulphite and Paper Mill Workers have been disclosed at the IWA headquarters in Portland, Ore. The new union would comprise more than 310,000 members.

Officials of the two AFL-CIO unions in a joint announcement reported that committees from each group had met in Chicago recently to establish a 10-point program of merger. Discussion and action by the respective executive boards is expected sometime in October. Their approval is considered likely.

Dust and Odors Under Control at Fibreboard

Fibreboard Paper Products Corp. has completed the installation of dust and odor control equipment at its San Joaquin pulp and board mill in Antioch, Cal. The cost of the project height of 80 ft., will oxidize gases at temperatures high enough to render them relatively odorless.
was well above $600,000.

In a recent report, William L. Keady, Fibreboard president, declared: "The expenditure of these funds for the benefit of the Antioch community as a place to live and as part of the growing center of industrial Contra Costa County is one more example of the Fibreboard Paper Products policy of sound good-neighborliness".

The new equipment expenditure was in addition to $750,000 spent for dust and odor control at the San Joaquin pulp and board mill in prior years.

The equipment includes a new flue gas washer with a capacity for cleaning gas at a rate of 140,000 cfm. To coordinate the new equipment with existing control devices, two precipitators already in operation were completely renovated.

Other major components include a 10,000-cu. ft. gas holder to absorb gases released when a digester is blown; a 40-ft. black liquor oxidizing tower, and a gas-incinerating furnace capable of burning gases at 1500°F.

Costs May Bar Canada from World Market

Clark B. Davis has predicted that rising production costs—especially in Ontario—may price Canada out of world markets. Davis is vice president in charge of woodlands for Abitibi Power & Paper Co. Ltd.

Speaking at a recent industry meeting in Port Arthur, the Abitibi official warned that Canadians must plan for the greatly increased drain on forestry resources that has been forecast over the next 25 years. Only in this way, he said, will the economy of the industry be best served.

St. Regis Lists Site Choice Methods

In advance of its 1955 decision to expand its southern operations beyond Pensacola, Fla., St. Regis Paper Co. considered and surveyed many sites. In a copyrighted article, the New York *Journal of Commerce* reported that the paper manufacturer listed the following factors as essential to the selection of a suitable location:

1. Proximity to large pulpwood supplies for present and future needs.

Now there's a NEW Pusey and Jones!

New management and extensive executive reorganization have virtually made a brand new company of Pusey and Jones!

Many improvements have resulted from it, among them on-time start-ups and even better performance from the complete line of Pusey and Jones Paper Making Machinery.

Ask your representative about the *new* Pusey and Jones, and how your company can benefit. Or write.

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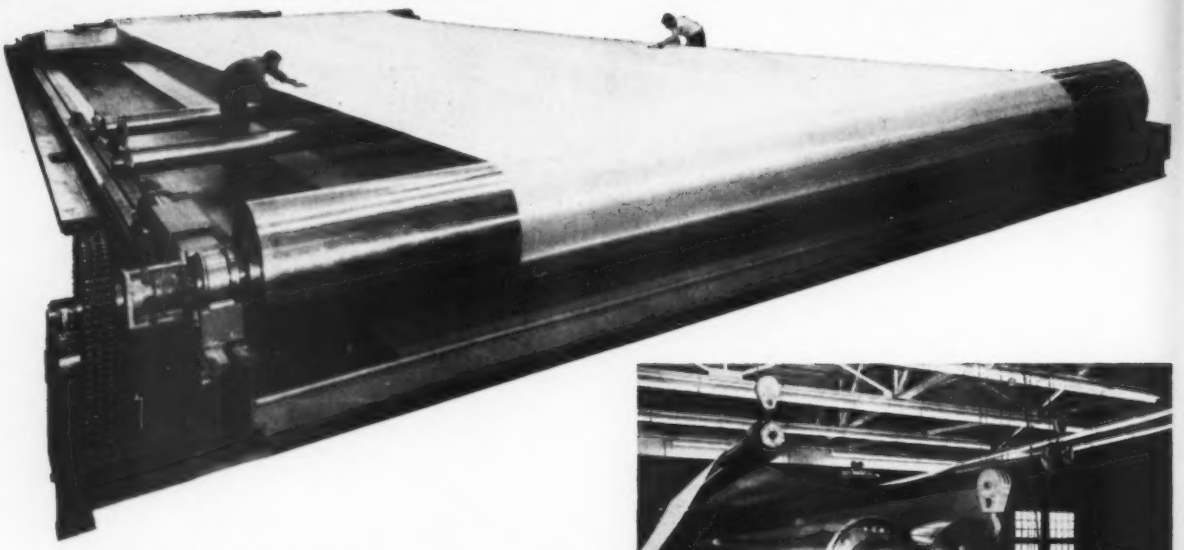
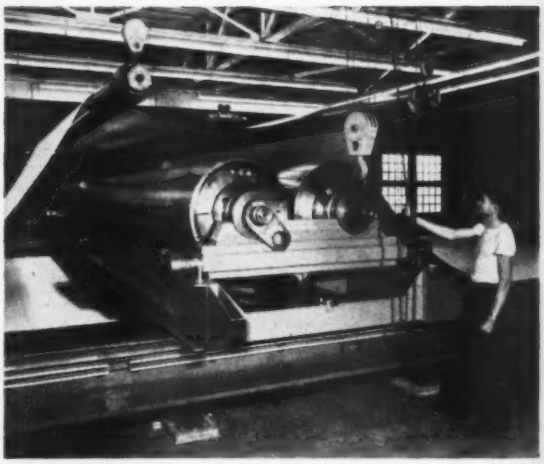
EXPORT DIVISION: FRAZAR AND COMPANY, 50 CHURCH STREET, NEW YORK 7

In specialized applications...
ACIPCO CENTRIFUGALLY SPUN STEEL TUBES





Appleton Wire Works, Inc., manufactures high quality fourdrinier wires for paper making machines. These fine-mesh wires are woven in widths up to 340 inches and lengths over 180 feet.

At its Montgomery, Alabama, plant, Appleton Wire Works, Inc. uses ACIPCO steel tubes— centrifugally spun and polished at Acipco—as stretch rolls on the huge finishing table. These 35.625″ OD, 410″ long rolls must be both dimensionally stable and balanced and must have a polished surface which will not affect the delicate woven wire surface mechanically or chemically.

Here is another example of Acipco versatility. If your application requires heavy wall steel or alloy iron tubes with special physical, chemical or metallurgical properties "built-in," Acipco can serve you. Investigate Acipco's complete "one source—from start to finish" facilities. A call or letter will bring full information on Acipco centrifugally spun tube applications in your field.

VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES

Size Range: Lengths up to 410″ to meet modern machinery requirements have been produced. OD's from 2.25″ to 50″; wall thicknesses from .25″ to 4″.

Analyses: All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel and special non-standard analyses.

Furnished: As cast, rough machined, or finished machined, including honing. Complete welding and machine shop facilities for fabrication.

SPECIAL PRODUCTS DIVISION
AMERICAN CAST IRON PIPE CO.
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News of the Industry . . .

2. Favorable transportation by rail, water and highway.
3. Ample supply of productive labor.
4. Plentiful supply of pure water.
5. Facilities for proper disposition of mill effluent and waste.
6. Fair tax rates—an important inducement to industrial development.
7. A favorable attitude on the part of local citizens and municipal, county and state authorities.
8. The generally good condition of community facilities for business, education, religious worship and recreation.

Jacksonville met all these requirements, and therefore St. Regis located its second Florida plant there. Mill employment now totals about 800. The operation represents an investment of more than $65,000,000.

$100,000 Project Completed at Consolidated Water Power & Paper

A new Inta-Roto Machine Co. laminator with maximum speeds in excess of 500 fpm has been installed at the Ahdawagam Div. of Consolidated Water Power & Paper Co. The $100,000 installation at Wisconsin Rapids, Wis., is equipped with a Clark-Aiken Co. sheeter and will laminate and sheet a 52-in. web using both adhesive and hot melt laminates.

As part of a continuing improvement program, the installation "adds flexibility to the present operation and enhances Consolidated's position as one of the few, if not the only, fully integrated manufacturers of paper to board laminated folding cartons".

Features of the new machine include water-cooled air brakes, a hydraulically-operated metering and combining section and Askania Regulator Co. side register controls.

Molecular Biology to be Studied at Syracuse

On October 1 the Molecular Biology Institute will be established at the State University College of Forestry (Syracuse University) at Syracuse, N. Y. The recent announcement was made by Dr. Edwin C. Jahn, associate dean and director of research for the College of Forestry.

Director of the new institute is Dr. Michael M. Szwarc, research professor of physcial and polymer chemistry.

In announcing the aims and objectives of the Molecular Biology Institute, Dean Jahn had this to say: "The purpose of the institute is to provide a nucleus for research and advanced study. Research in plant biochemistry and biophysics is necessary in order for us to understand most of the physiological processes of the living tree . . . to understand such important matters as nutritional problems . . . enhancement of disease-resistance . . . and the improvement of tree form, quality and growth rate.

"Most agricultural colleges have strong programs in this field, but this aspect of research has been largely neglected in forestry."

Badger Paper Mills Employees Honor Founder in Memorial

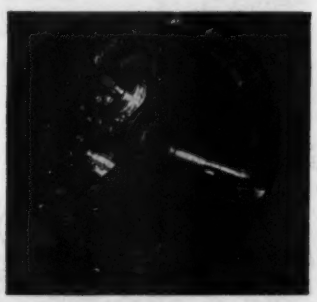
Nineteen years of labor-management harmony are being honored at Badger Paper Mills Inc. in Peshtigo, Wis. Office workers and union members are erecting a memorial in honor of the company's late founder,

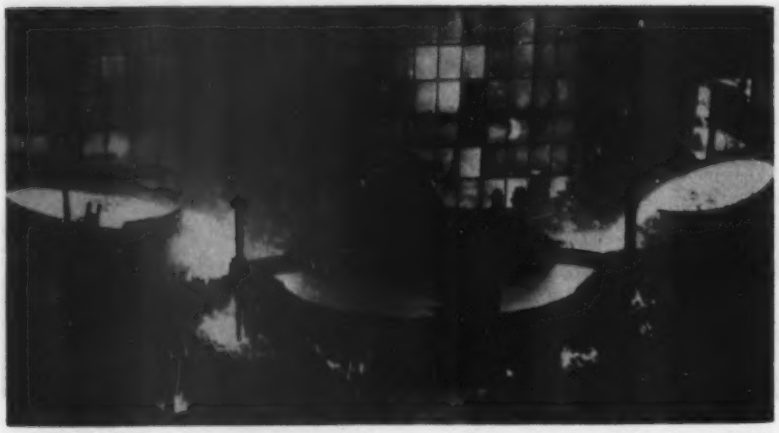
STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA





THE RECENT CASTING of a 37-ton Yankee dryer cylinder represented the largest single metal-pouring operation in more than ten years at Pusey & Jones Corp., Wilmington, Del. The dryer will be delivered to Peavey Paper Mills Inc. at Ladysmith, Wis., for use in the manufacture of tissue. The casting of the shell—a cylindrical unit 10 ft. in diameter and 15 ft. long—cooled over a seven-day period and was then finished in the P&J machine shop. The completed dryer will weigh approximately 45 tons.

Edwin A. Meyer. Meyer died February 28.

The memorial is to consist of a center column topped by a sundial, below which will be the hands of labor and management in a handclasp signifying 19 years of peaceful negotiation between employer and employee. Extending from the column will be three wings, one representing Meyer, one labor and one management.

Meyer founded Badger Paper Mills from the ruins of two other firms in 1929, proceeding to build the company into one of the largest in northeastern Wisconsin. The company hummed right through the depths of the depression at capacity production.

Badger was one of the first paper mills to honor union charters, the first of which was organized in 1939. A unique pension plan, financed entirely by the company, was established in 1942; a profit-sharing plan went into effect in 1948. At that time, Meyer told his employees:

"This has been a dream of mine for a long time. It is not my thought that when a man reaches retirement age he should sit on the front porch and whittle. He should have money to enjoy his old age."

Soon after Meyer's death company employees suggested to the leadership of the four unions concerned in the operation of the mill that a memorial be constructed. And so, with the cooperation of the plant's office personnel, it was decided to locate the monument in Triangle Park in the heart of the town that Meyer helped to build and perpetuate as an example of the best in company-worker relations.

MacMillan & Bloedel Completes Expansion at Port Alberni

An $83,000,000 pulp and paper expansion has been completed at the Port Alberni, B.C. plant of MacMillian & Bloedel Ltd. The mill's second newsprint machine (a Beloit Iron Works unit) entered production in July.

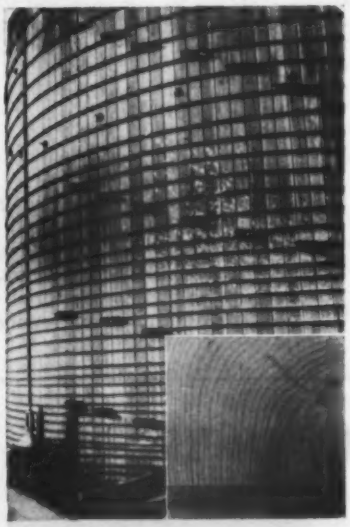
The first machine went on the line in August 1957.

The mill, which originally produced only unbleached sulfate pulp, now has four machines turning out unbleached and semi-bleached pulps, kraft paper and board, as well as newsprint. Daily production capacities are presently as follows: market pulp —250 tons; kraft paper and/or board —200 tons, and newsprint—700 tons.

The Alberni operations of MacMillan & Bloedel—lumber, plywood, shingles pulp, kraft paper and newsprint—represent one of the most highly integrated wood-using areas on the continent, utilizing "all the wood in the log" for the end product to which it is best suited.

Project engineering was done by H. A. Simons Ltd., while the general construction contractor was Dominion Construction Co. Ltd.

(Turn to Page 382)



Typical blow pit installation in Eastern paper mill.

Enlargement shows grain density of Long-leaf Yellow Pine used in this installation.

ARROW

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ARROW blow pits and heavy storage tanks are built with care and precision seldom equalled in timber manufacture. Sizes up to 40' dia. x 32' high from single piece material.

Joints and surfaces are planed smooth. Bottoms and top heads are cut and chamfered in one piece, resulting in perfectly fitting croze joints . . . Arrow Tanks are guaranteed tight.

False bottoms, head trusses and braces, and other fittings can be installed.

We can erect our tanks and pits for you or furnish them knocked down with a complete set of erecting instructions for erection by plant personnel.

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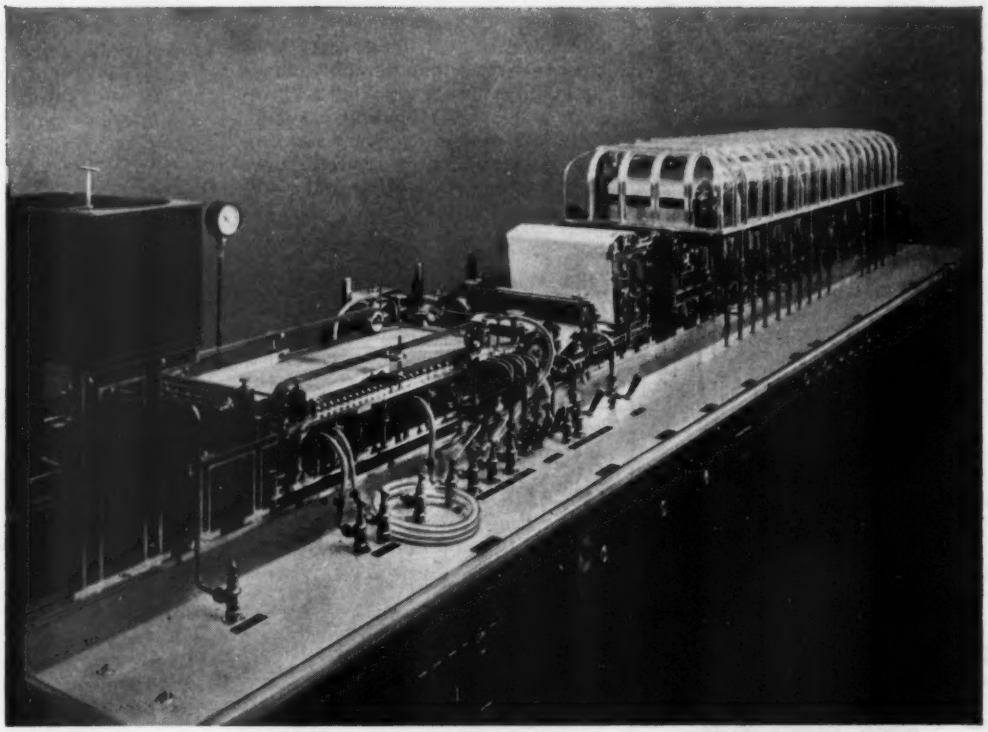
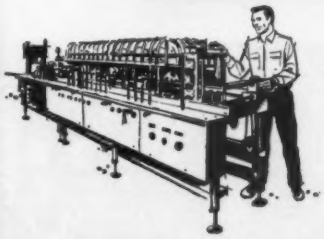
GET top quality experimental paper with NEW P & W Midget Fourdrinier Paper Machine





...and keep your full-size machines producing!

This one-man midget paper machine does a giant job of experimental paper-making the world over–serves the U. S. Bureau of Standards and other government laboratories... is favored at many leading American paper plants... and finds uses in the textile and plastics industries. All-electric operation makes it safer, cleaner, simpler than ever. Install the new P & W Midget Fourdrinier to keep your heavy equipment at profitable work while one operator—using the customary temperatures and pressures—tries out many types of paper which you can later duplicate on full-size machines.

These additional features help explain its world-wide acceptance:

Paper Quality Comparable to full-size Fourdrinier products

Weight of paper 12–120 lbs

Output Up to 3.3 lbs/hr

Speed 1.6–6.5 ft/min

Overall length 13' 1"

Overall width 32"

Working width 8-3/4"

Write for full descriptive literature—today.

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You'll have plenty of company, for Paper Mill men everywhere are using Jenkins' METLKOR brushes for every paper brushing application. They are built better, to perform better, and last longer.

Jenkins' METLKOR Paper Polishing Brush.

JENKINS' PAPER MILL BRUSHES

Blanket washer • Coating • Conveyor • Dampening • Dusting • Feed • Felt cleaning • Flocking • Fourdrinier wire cleaning • Nutmeg roll cover • Offset powder removal • Paint brush • Polishing • Scrap removal • Sieve • Spray • Static elimination • Void detector • Web cleaning.

BRUSHES FOR PRINTERS: Cylinder hold down • Dusting • Nutmeg roll cover • Offset dampener roll cleaning • Offset powder removal.

Specify Jenkins' METLKOR
the original . . . the best *Metal-Core* brush

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CYLINDER BRUSHES
and **LIFEWOOD®** WOOD BACKED BRUSHES

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Recent Expansions in the Industry

Canadian Kodak Co. Ltd.,
Totonto affiliate of Eastman Kodak Co., is constructing a $1,000,000 building to house finishing operations in the production of photographic paper. Equipped to handle all operations after rolls of raw paper—up to 43 in. in width and as much as 16,000 ft. long—have been coated with a photographic emulsion, the structure completes a five-year $5,000,000 expansion program. Finishing procedures include cutting the rolls into sheet or roll paper form, slitting, inspecting and packaging.

Olin Mathieson Chemical Corp.
has started production of corrugated containers at its new Cincinnati plant. The 127,000-sq. ft. facility has been leased on a long-term basis from Lunkenheimer Co. The plant boasts an 85-in. corrugating machine and auxiliary equipment and will have a monthly capacity of 30,000,000 sq. ft. Raw material is shipped to the Cincinnati location from the firm's kraft pulp and paper mill in West Monroe, La.

Mead Containers Inc.,
wholly owned subsidiary of Mead Corp., has acquired the total assets of Grand Rapids Container Co. of Grand Rapids, Mich. The plant—which will operate as the Grand Rapids Div. of Mead Containers—has 100 employees producing corrugated shipping containers and corrugated packaging. No change in management or personnel is contemplated.

St. Regis Paper Co.
has reported that Magnolia Petroleum Co. (a subsidiary of Socony Mobil Oil Co. Inc.) will make a thorough geophysical study of some 200,000 acres of St. Regis lands in Florida and Alabama. If Magnolia should find areas indicative of oil-bearing formation during the exploration period, it will be granted development rights (under certain conditions) extending over the next five years.

Albert J. Reed Ltd.,
British pulp and paper manufacturer, is negotiating terms for the construction of a $20,000,000 mill in Port of Spain, Trinidad, for the manufacture of paper from sugar cane bagasse. Annual production of 50,000 tons is scheduled to begin late in 1959.

Capital City Container Co. Inc.,
Albany, N.Y. manufacturer of corrugated shipping containers, boxes, etc., plans a one-story factory and warehouse addition. The project would add 22,000 sq. ft. to the firm's 82,000-sq. ft. plant.

Mead Corp.
of Dayton, Ohio, has purchased a substantial interest in Lamex Inc., Norcross, Ga. producer of polyethylene products for the textile, food and paper industries.

East Texas Pulp & Paper Co.
is nearing completion at Evadale, Texas, of a machine room that will house a cylinder board unit that is to be transferred from Southland Paper Mills Inc. in Lufkin. Production is scheduled for early fall. The 50- by 750-ft. structure will also house a rewinder and cutter. The machine itself (a Pusey & Jones Corp. unit) has five cylinders and a width of 110 in. Producing board ranging in caliper thickness from .016 to .036 in

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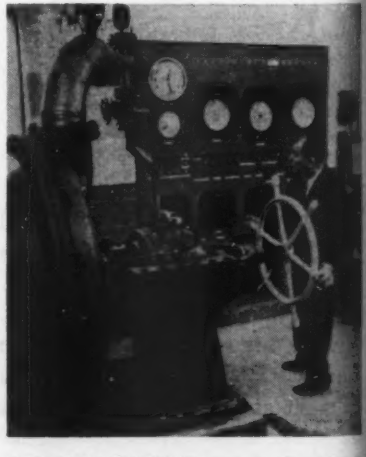
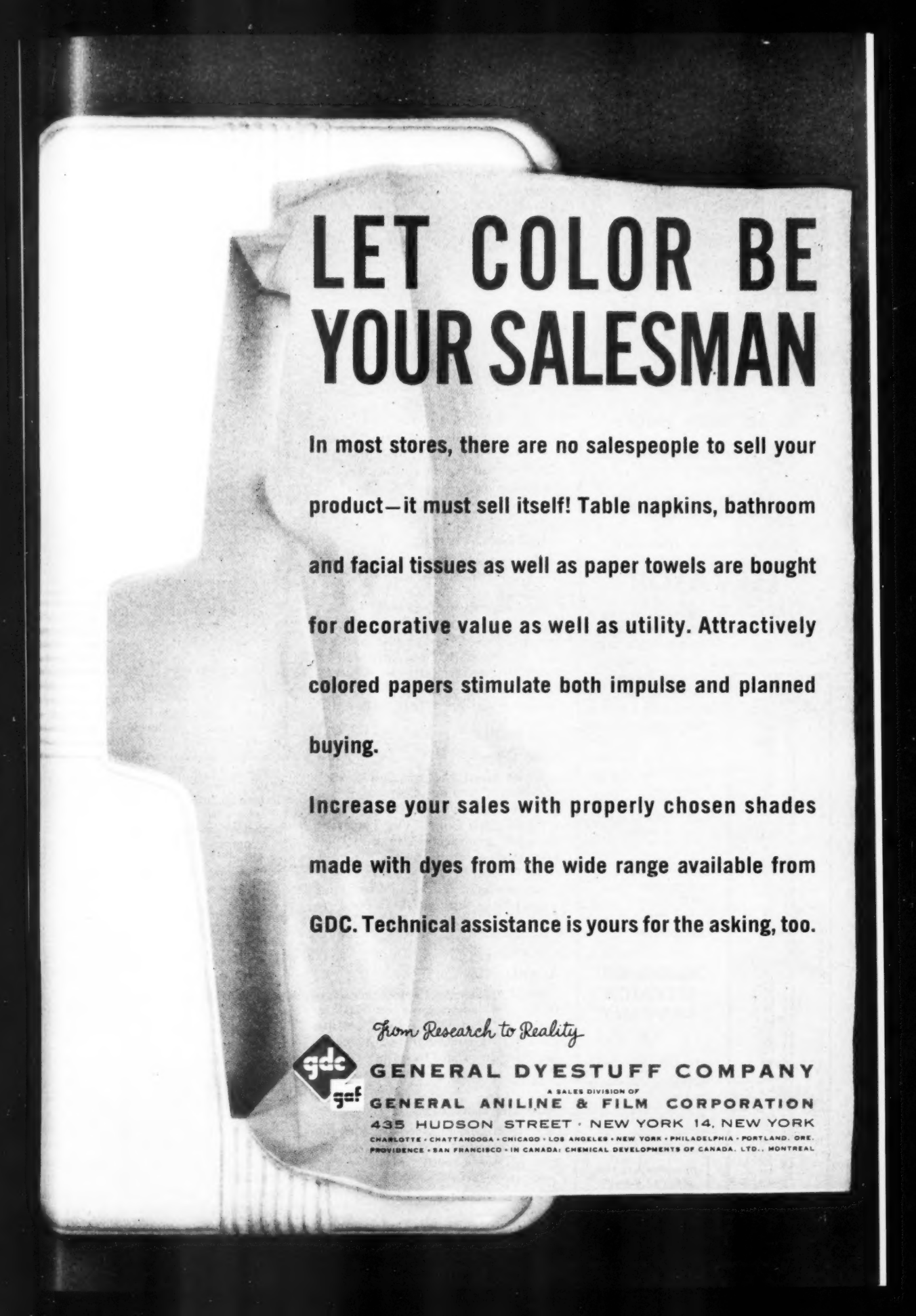


EMERSON CLAFLINS are on the job in the production of Neutracel pulp at the Erie, Pa. mill of Hammermill Paper Co. The above photograph (from a recent Hammermill ad in "Time" magazine) shows one of the three Claflin units. The three installed by the Pennsylvania papermaker include one #2 with ½-in. iron alloy plug fillings and special hydrating shell fillings and two #3's also with ½-in. iron plug and shell. On all three the head, inlet and outlet are lined with 316 stainless.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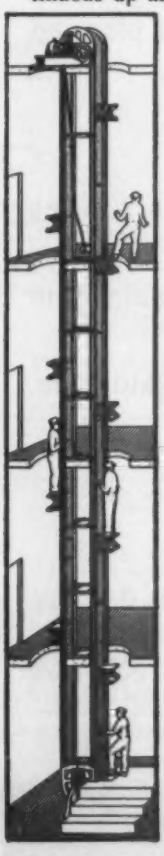

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News of the Industry . . .

either rolls or sheets, it will have a daily capacity of 80 tons. The stock preparation equipment will include eight jordans and two separate stock systems.

Bergstrom Paper Co.

of Neenah, Wis., is making changes in its power plant aimed at improving production. Included in the project are water walls in No. 3 boiler to increase its capacity; new induced draft fans and the relocation of an existing forced draft fan to provide better air distribution and combustion conditions, and two new inclined screens replacing the old Lancaster washers.

Inland Container Corp.

of Indianapolis has acquired a majority of the outstanding stock of General Box Co. of Des Plaines, Ill. In addition to its Des Plaines plant, General Box operates facilities at Louisville, Ky., and at Kansas City, Mo. (General Box has filed suit in federal district court in Chicago against Inland alleging that the acquisition violates antitrust laws.)

Mead Corp.

has purchased the remaining stock of Miller Container Corp. of Louisville, Ky., since 1954 a manufacturer of corrugated boxes. The Louisville firm will be operated as a division of Mead Containers Inc., wholly owned subsidiary of Mead Corp. (Just one year ago Mead Containers acquired a substantial interest in Miller.)

American Can Co.'s

Dixie Cup Div. has completed a 93,-000-sq. ft. addition to its Darlington, S. C. plant. The project, costing an approximate $250,000, increases warehousing space by 60 per cent.

American Can Co.'s

Marathon Div. in Neenah, Wis., has installed and is now operating the first of two Cerutti "Model America" rotogravure presses. The six-color 44-in. machine is being used for the printing of cellophane, foil and paper wraps. It is equipped with single-roll unwind and rewind and electronic tension control, has two reversible units and two flexographic conversion units. (Cerutti presses are distributed throughout the Western Hemisphere by Parsons & Whittemore Graphic Corp.)

National Safety Congress Set for October 20-23

Highlighting the Pulp & Paper program at the forthcoming National Safety Congress in Chicago will be the annual presentation of awards for outstanding achievement in accident prevention. The meetings of the Pulp & Paper Section are to be staged at the Conrad Hilton Hotel October 20-23.

The principal awards, which will be presented during the annual joint luncheon with the Wood Products Section, are the Edward Benton Fritz Memorial Trophy and the Arthur Hoyt Scott Award. The former, sponsored by Fritz Publications Inc. and The PAPER INDUSTRY, goes to that mill that in the opinion of the contest judges achieved the most outstanding safety record during 1957. The Scott Award goes to the company that—in all its plants combined—reported the best performance.

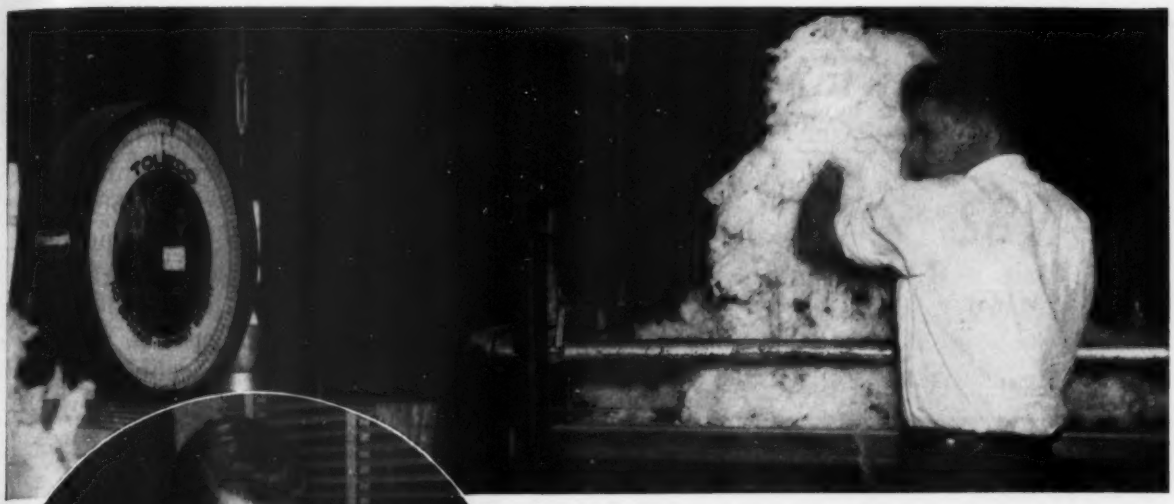
Keynoting the section meetings will be L. A. Combs, vice president in charge of industrial relations for Container Corp. of America, Chicago.

Other principal speakers will include: O. C. Haier, safety manager for Standard Oil Co. (Ohio); Dr. E. J. Schowalter, medical director for Western Electric Co. Inc.; Dr. J. M. Bosworth, divisional medical director for Liberty Mutual Insurance Co., and George A. LaHusen, general safety supervisor for Crown Zellerbach Corp.

Addressing the luncheon meeting will be Paul Jones, director of public information for the National Safety Council. His subject is to be, "How to be Happy Though Safe".

In a special joint session with the Wood Products Section at the Congress Hotel on October 23, Alfred R. Lateiner will discuss "Training for Accident Control". He is a consultant in training and safety from Mamaroneck, N. Y. Also on the program will be a motion picture "Sucker Bets" produced by the Lumbermen's Safety Association of Toronto.

As is the case every year, the Pulp & Paper Section program will include round table discussion sessions on Pulp Manufacturing, Paper Converting, Pulpwood Logging, Insulating and Roofing, Folding Paper Box and Shipping Container and Paper Manufacturing.



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MEET Pieter Shuler Diehl—
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of Asa Shuler, who, with J. W. Benninghofen,
founded this company 100 years ago.
From his first vacation job
in our pickering room, six summers ago,
to his present administrative position
following this spring's graduation from
The Philadelphia Textile Institute,
he has been trained in the tradition
that makes Hamilton Felts—*better* felts.

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Uniform every time—in style and porosity.
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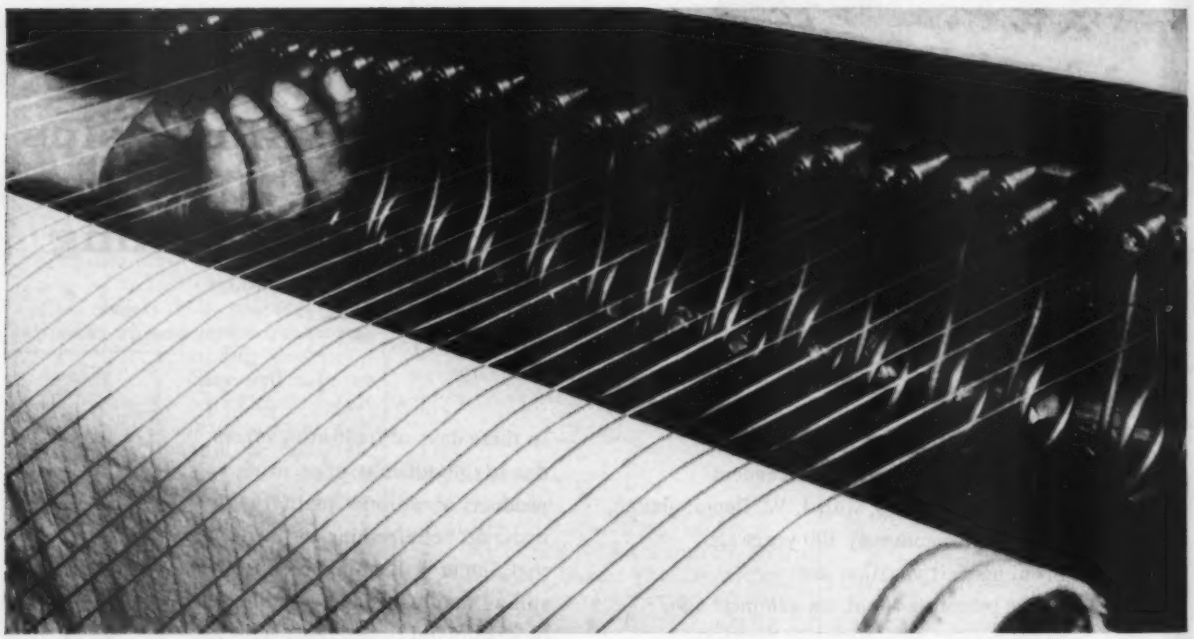
These strands of wire emerging from the tubes of the annealing furnace have a new, different personality. Annealing is an important factor in determining the physical characteristics of wire. Tensile strength, resistance to wear, flexibility are *built-in* by carefully-controlled annealing temperatures and speeds. Wire is tailor-made for its specific application . . . another reason why Appleton wires are good wires.



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News of the Industry . . .

Allied News Notes . . .

Beloit Iron Works recently marked the 100th anniversary of its founding at its Beloit, Wis. plant. Top executives from paper firms throughout the country were guests of the machine manufacturer during the two-day celebration, which coincided with the annual executive conference at the Institute of Paper Chemistry in Appleton. Following a plant tour, E. H. Neese, Beloit board chairman, dedicated a centennial plaque.

Huyck Felt Co. was host recently to 60 papermakers attending a Felt Forum at Wisconsin Rapids, Wis. Subjects discussed included felt manufacture, design engineering, Huyck's field service engineering, suggestions for improving felt operation, cleaning, chromatographic analysis, the crown test, etc.

DeZurik Sales Co. has announced the opening of a Philadelphia district office under the management of William Drummond. The office serves the territory formerly covered for DeZurik Corp. by Delaware Valley Engineering Co.

Pfaudler Permutit Inc.'s Permutit Div. has acquired the flotation equipment business owned by Bulkley-Dunton Pulp Co. Inc. The purchase includes the trademark and manufacturing rights for the Colloidair separator used for the clarification of process waste liquids and the recovery of materials in liquid suspension.

Monsanto Chemical Co. has announced the commercial availability of Mersize fortified rosin size from tall oil rosin. The announcement was concurrent with the start-up in Nitro, W. Va., of tall oil refining facilities owned jointly by Monsanto and Emery Industries Inc.

H. B. Slaugenhaup Co. of Chambersburg, Pa., largest dealer in army surplus and vehicles, is now operating under new management as the Allegheny Branch of **Memphis Equipment Co.**, Memphis, Tenn. Memphis Equipment is the nation's largest distributor of army trucks and parts and construction equipment.

Coming Events

Tappi

September 24-26—12th Alkaline Pulping Conference, Arlington Hotel, Hot Springs, Ark.

September 30-October 2—Ninth Testing Conference, General Oglethorpe Hotel, Savannah, Ga.

October 9-10—Third Deinking Conference, Biltmore Hotel, Dayton, Ohio

October 20-22—13th Plastics-Paper Conference, Sheraton-Kimball Hotel, Springfield, Mass.

November 5-6—Eighth Corrugated Containers Conference, Netherlands-Hilton Hotel, Cincinnati

Superintendents Association

September 18-20—Northeastern Division, Poland Spring House, Poland Spring, Maine.

October 10-11—Pennsylvania-New Jersey-Delaware Division, Bedford Springs Hotel, Bedford Springs, Pa.

October 15-17—Southern and Southeastern Divisions (joint meeting), Read House, Chattanooga, Tenn.

Other meetings

September 28-October 2—Electrochemical Society Inc., Chateau Laurier, Ottawa

October 13-15—Packaging Institute Inc., 20th Annual Forum, Edgewater Beach Hotel, Chicago

October 20-24—46th National Safety Congress, Chicago

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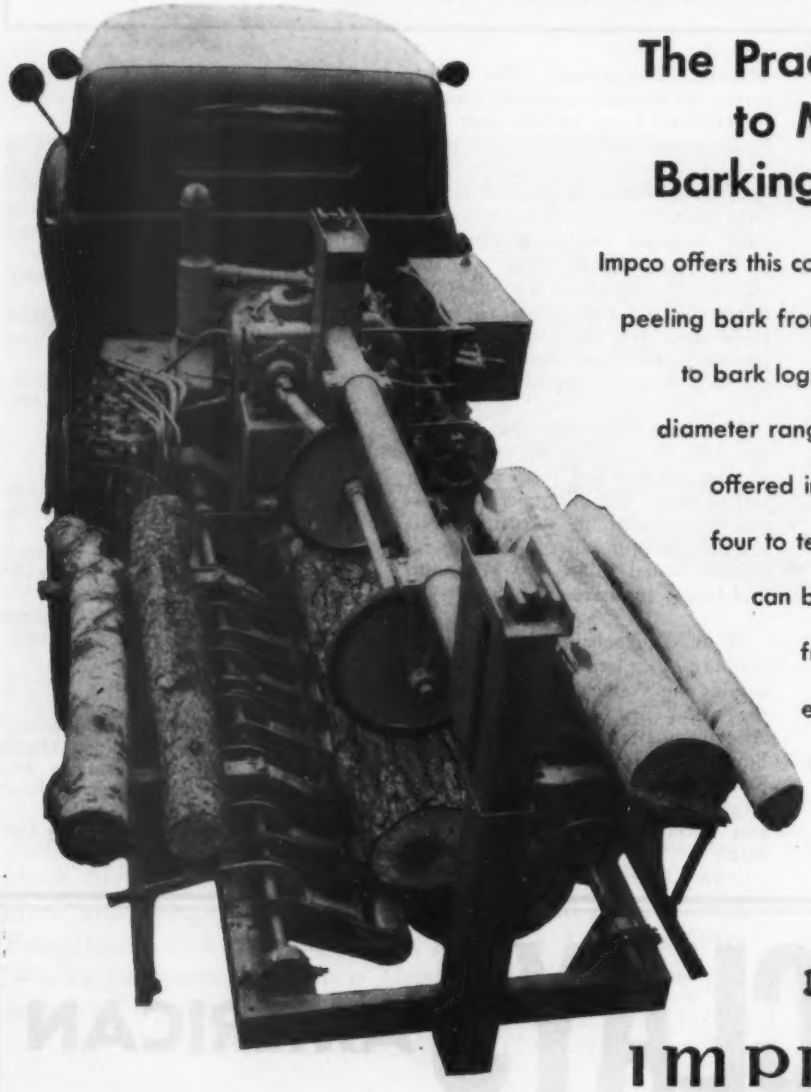

The Practical Answer to Multi-Unit Barking Operations

Impco offers this completely new portable unit for peeling bark from any type of wood. Designed to bark logs in the three to twenty-six inch diameter range, the side-fed Porta-Peeler is offered in various models for bolts from four to ten feet in length. 100% removal can be obtained even with crooked, frozen hardwood. One man can easily *Porta-Peel* four sticks per minute. For further information, write for Bulletin F1-2.

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NAMES *in the* NEWS

R. F. Erickson

Clyde B. Morgan

Erickson Heads Rayonier

Russell F. Erickson has been named to replace Clyde B. Morgan as president of Rayonier Inc.

Erickson joined Rayonier in 1946, later becoming plant engineer and resident manager at the Fernandina Beach, Fla. mill. In 1950 he was made vice president in charge of engineering and manufacturing. He was given a directorship in 1956 and was made executive vice president late last year.

Morgan has been elected chairman of the board to succeed the resigning William A. Parker, who has served in the post since 1946 and who will continue as a director and chairman of the executive committee. Morgan had been president and chief executive officer since 1951.

The new president is a graduate of the University of Minnesota and began his career in the paper industry with Minnesota & Ontario Paper Co. He was later on the staff of a New York, N. Y. consulting engineering firm and immediately prior to joining Rayonier was associated with Hollingsworth & Whitney Paper Co.

Tappi Forms New Post

R. G. Macdonald, formerly secretary-treasurer, has been named to the newly formed position of executive secretary-treasurer of Tappi. P. E. Nethercut, technical secretary since February 1957, becomes assistant executive secretary.

Under Macdonald's leadership of more than 30 years, Tappi has grown from a membership of about 700 to a membership of more than 9000. Prior to joining the association staff, he had been with Pejepscot Paper Co. in Brunswick, Maine. Macdonald was at one time market research manager for *Chemical and Metallurgical Engineering*.

Before joining the Tappi staff, Nethercut was associated with Watervliet Paper Co. and Scott Paper Co.

Scheid Advanced by Watervliet Paper

Louis J. Scheid has been advanced from chief engineer to director of manufacturing for Watervliet Paper Co. of Watervliet, Mich. At the same time Carl L. Burdell was named to replace Scheid as chief engineer, and Dean D. McKinney was made personnel manager.

Scheid joined the Watervliet staff in 1934 and during the past ten years has served both as general superintendent and as chief engineer.

SPECIAL KNOWLEDGE in the field of pulp and paper has earned for Fred Wittner a place on the United States Trade Mission to Yugoslavia. Shown above (r) with Secretary of Commerce Sinclair Weeks just prior to his departure, Wittner was scheduled to meet with industry officials in the eastern European country and to represent the U. S. at trade fairs in Belgrade and Zagreb.

Wittner is president of Fred Wittner Advertising in New York, N. Y., and has served the paper industry and its suppliers as the advertising and public relations agency for such firms as Parsons & Whittemore, Northeastern Paper Sales, Stora Kopparberg, J. M. Huber and Eastman Chemical Products.

L. J. Scheid

C. L. Burdell

Burdell was formerly staff engineer for Allied Paper Corp. in Kalamazoo, while McKinney has held various posts in the industrial relations department of Hammermill Paper Co. in Erie, Pa., during the past 11 years. (Watervliet is a wholly owned Hammermill subsidiary).

Abitibi Appointments

Abitibi Power & Paper Co. Ltd. has announced the following appointments:

J. G. Morrison, formerly mill manager at the Fort William (Ont.) Div., becomes assistant manager for manufacturing (pulp and board). He has joined the executive office organization in Toronto.

Replacing Morrison at Fort William is T. C. Anderson, formerly project manager of the Fort William expansion program.

Mateer Retires

Raymond C. Mateer, executive vice president of Scott Paper Co., has retired after 45 years with the firm.

His career with the Chester, Pa. company began in 1913, when he started as a helper in the cabinet department. By 1922 he had progressed through several positions and was named purchasing agent. Five years later he was appointed assistant treasurer and at the same time was elected to the board of directors.

Mateer in 1938 became vice president responsible for all the purchasing activities of Scott Paper. In 1941 he became president of Marinette Paper Co., a wholly owned

Names in the News . . .

Scott subsidiary, and in 1947 was named executive vice president.

The company's executive functions will be carried out by a committee composed of Scott vice presidents Paul C. Baldwin, Harrison F. Dunning, James L. Madden, G. Willing Pepper and Andrew J. Schroder II. Schroder will serve as committee chairman.

R. C. Mateer

Claude Bos

Allied Names Bos

Claude Bos has been appointed to the newly established position of mill manager for the Bryant coating mill of Allied Paper Corp. in Kalamazoo, Mich.

Associated with the paper industry for the past 25 years, Bos is a member of both Tappi and the Superintendents Association.

At the same time, Allied Paper announced that Dr. John Fanselow has been engaged as a special consultant on technical problems and the development of new products. He is an instructor in the school of paper and paper technology at Western Michigan University.

Mead Honored

George W. Mead has been elected honorary chairman of the board by the stockholders of Consolidated Water Power & Paper Co. in Wisconsin Rapids, Wis.

Mead served as general manager of the firm from 1903 until his retirement in 1950 and was president from 1916 to 1950.

He has been succeeded as a director by Harold Murtfeldt, vice president for enamel paper sales.

Nekoosa-Edwards Paper Co. has reported that its engineering and power departments have been merged into one unit called the Engineering & Power Department. Heading the new set-up is **Frank H. Coldwell,** formerly manager of power. Continuing his present duties as manager of engineering is **Robert E. Simkins.** Steam superintendent is **William Laidig,** formerly a steam engineer.

Rayonier Inc. has announced three major executive appointments for its southeastern operations: **Donald E. Lawson,** assistant resident manager of the Fernandina (Fla.) Div., becomes assistant resident manager for engineering and maintenance at the Jesup, Ga. plant; he replaces **Earl K. Murphy,** who has been named chief engineer of the Southeast Central Engineering Div., and **Frank C. Hawks Jr.** has been appointed assistant resident manager of the Fernandina Div. Hawks was formerly assistant resident manager at Shelton, Wash.

James E. Jones has been named secretary of the Industrial Relations Committee of the American Paper & Pulp Association to fill the vacancy left by the recent resignation of Harrison J. Daysh. Jones was formerly executive office personnel manager for Bigelow-Sanford Carpet Co. Inc.

J. E. Jones

Vertrees Young

Vertrees Young of Bogalusa, La., has been elected a director of Crown Zellerbach Corp. He is a Crown Zellerbach vice president and general manager of mill and timber operations for the Gaylord Container Div. Young retired from active day-to-day management duties on July 31 but continues in a consulting capacity.

Kurtz M. Hanson, for the past eight years president of Champion-International Paper Co. of Lawrence, Mass., resigned the end of May. His future plans are "indefinite." (Champion-International, formerly a wholly owned subsidiary of the National Geographic Society, was recently purchased by Oxford Paper Co.)

Gilbert K. Dickerman, technical director for Consolidated Water Power & Paper Co. since 1927, has been named to the newly created position of director of corporate planning and development for the Wisconsin firm.

A. C. McCorry has been named manufacturing representative for the Kraft Pulp Div. of St. Regis Paper Co. His headquarters are at Tacoma, Wash. McCorry had previously been superintendent and production manager at St. Regis' new pulp mill in Hinton, Alta.

Robert C. Etnire, chief industrial engineer, has been named director of production for River Raisin Paper Co. of Monroe, Mich.

Norman W. Wilson, chairman of the board of Hammermill Paper Co., was recently awarded an honorary Doctor of Laws degree at the 109th commencement ceremonies of Lawrence College, Appleton, Wis. Associated with the Erie, Pa. firm since 1901, Wilson was named president in 1940 and board chairman in 1953.

Robert S. Ives has been named director of research for Ludlow Papers Inc. of Needham Heights, Mass. He was formerly president of his own research consulting firm.

Walter S. Liebman, vice president of the Morris Paper Mills Div. of Federal Paper Board Co. Inc., retired June 30. He began his association with Morris Paper Mills in 1926 in Chicago.

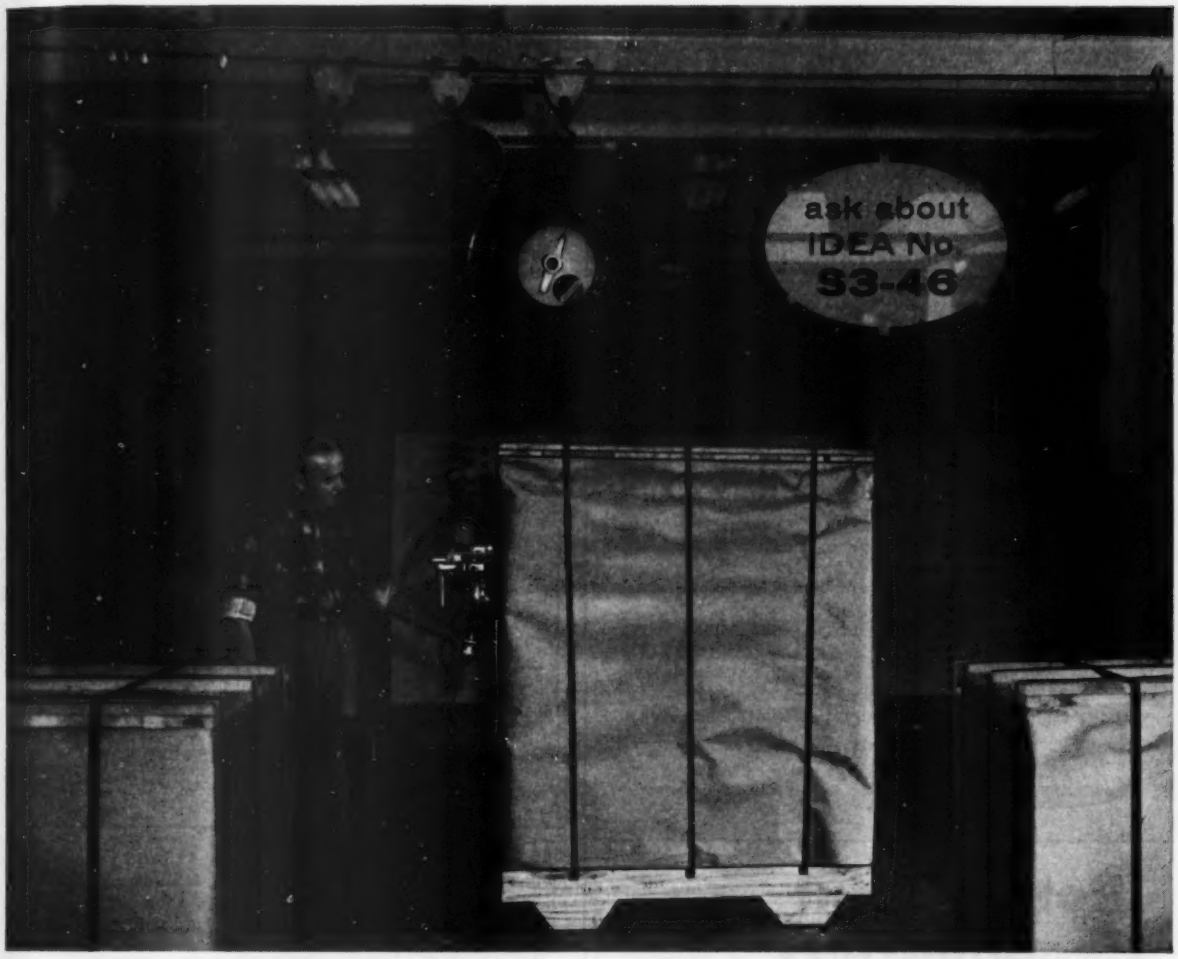
Arthur T. Severance, head of the commercial analysis group of West Virginia Pulp & Paper Co.'s Merchant Paper Div. at Mechanicville, N. Y., has been named regional administration manager of the Multiwall Bag Div. The division operates plants at Mobile, Ala.; New Orleans, La.; St. Louis, Mo.; Torrance, Cal., and Wellsburg, W. Va.

Thomas Gerace, formerly assistant to the manager of pulp production, has been appointed manager of the Printing Paper Div. mill of St. Regis Paper Co. in Sartell, Minn.

Allied Personalities . . .

E. A. Alvord has been transferred from Meridian, Miss., to Olympia, Wash., where he will represent Sprout, Waldron & Co. Inc. to the pulp and paper industry on the West Coast. Prior to becoming associated with the firm, Alvord was on the staffs of U. S. Gypsum Co. and Flintkote Co.

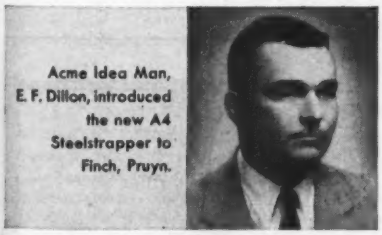
(Continued on Page 412)



Check your *AIM . . . Finch, Pruyn does . . .

Full-power tool makes strapping faster, easier

POWER TENSIONING, POWER SEALING AND POWER CUTTING; now it's all done with the new A4, the first fully powered steel strapping tool! Finch, Pruyn and Company, Inc., Glens Falls, New York, manufacturers of printing and converting papers, is proving the advantages of the A4 Steelstrapper every day. (Idea No. S3-46)



Acme Idea Man, E. F. Dillon, introduced the new A4 Steelstrapper to Finch, Pruyn.

Both the A4 and a reel of Acme Steel Strapping are mounted on a traveling hoist that can be moved over any part of the strapping floor . . . nothing to carry; nothing to cart around. The A4 is easily operated on top of high skids and in other difficult-to-reach places. It can be used on small flat surfaces because of its short strap base.

One hand operates the A4. The operator presses one control and strap is air-power tightened to a pre-determined tension. He presses another on the same handle, and magazine-fed seals are crimped and the strapping is cut . . . without waste, without effort!

***Check your Acme Idea Man** for a demonstration of the new A4 and full information on various overhead mounting systems. Call the nearest Acme Steel Company office or write: Dept. PKS-98, Acme Steel Products Division, Acme Steel Company, Chicago 27, Ill. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

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It's a Magliner Magnesium Dock Board

. . . and cross over to fast, immediate cost cuts on your dock. Magliners hurry loading operations . . . hustle men, loads and equipment back and forth between dock and carrier safely . . . in less time, *for less money*. Magnesium light, Magliners are quickly and easily moved from one carrier to the next. No wasted time—no idle man-power between loadings. Magnesium strong, Magliners cost less to maintain . . . they're built to take the everyday pounding of heavy power truck traffic year after year. For efficient dock-to-carrier handling at low capital investment, specify Magliner Magnesium Dock Boards. *You'll be dollars ahead when you do!*

WRITE FOR BULLETIN DB-204

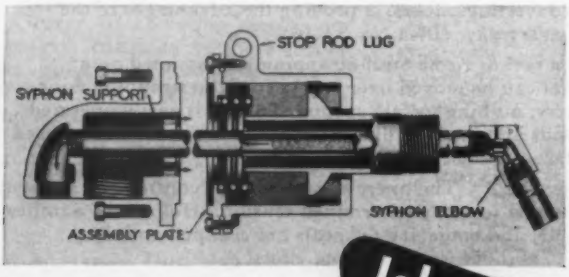
MAGLINE INC., P.O. Box 139, Pinconning, Mich.

Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario

MagLiner

Rotary Joint Headquarters

★ Johnson started the whole idea. Today's *complete* line includes sizes from ¼" to 8" . . . self-supported, pipe-supported, or rod-supported . . . for stationary or rotating syphon pipe . . . all operating speeds and pressures . . . for paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses.



Type SDP shown. Hinged syphon elbow replaces unwieldy curved syphon pipes with two straight pipes. Newest Johnson development is the Quick Release nipple. Write for Bulletin S-3001.

Johnson Rotary Pressure Joints

First in the Paper Industry

THE JOHNSON CORPORATION

845 Wood St., Three Rivers, Michigan

PATENT REVIEWS

MELVIN NORD*

Recovery of chemicals in wood pulp preparation

U.S. 2,824,071, issued Feb. 18, 1958, to Kenneth R. Gray, Hartzell L. Crosby and John C. Steinberg, assigned to Rayonier Inc., describes a process for the recovery of the chemicals from sulfite waste liquor and their cyclic use in the process.

The invention provides a simple practical process for converting the sodium content of soda-base acid sulfite waste liquor into a fluid smelt predominating in sodium carbonate and sodium sulfide, with recovery of heat and recovery in the smelt of a substantial portion of the sulfur originally present in the waste liquor.

The invention further provides a simple process for converting this smelt into solid sodium carbonate of such high purity that it may be used for the preparation of acid sulfite digestion liquor, and which is so nearly water-free that it may be used for neutralizing and lowering the sulfidity of the sulfite waste liquor

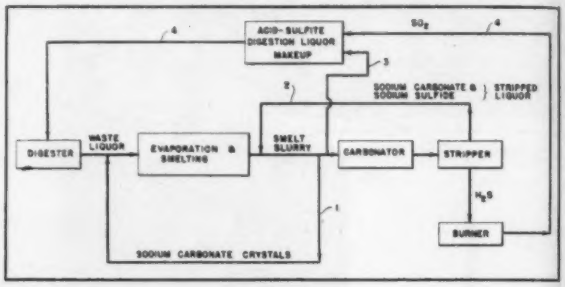


Fig. 1

without resulting uneconomical dilution. Simultaneously, the sulfide content of the smelt is recovered in the form of concentrated hydrogen sulfide, which can be readily burned to sulfur dioxide of such concentration that it can be readily and conveniently used in the preparation of acid sulfite digestion liquor.

The process is shown schematically in Fig. 1.

Flow-eveners for wood chip digesters

U.S. 2,821,476, issued Jan. 28, 1958, to Frank B. K. Green and assigned to Pandia Inc. relates to the continuous digestion or cooking of wood chips to be made into paper pulp. A principal purpose of the invention is to even out the discharge of chips from the end of the screw conveyor in each pipe so that the discharge from that pipe is substantially uniform. In this way, the flow-through rate or capacity of the pipe is increased without increase in the size and number of the pipes.

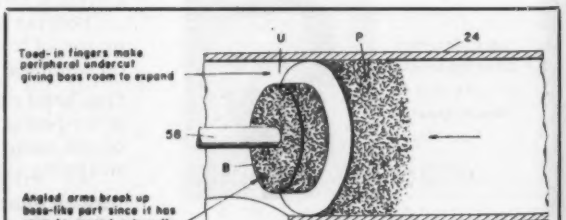


Fig. 2

As shown in Fig. 2, the wood chips are supplied to the hopper of the feeding-in zone A, and the screw feeder 12 forces the chips into the pre-heater zone B under conditions that prevent any sub-

*Patent attorney, 17600 Pinehurst, Detroit 21.

stantial loss of steam from the latter. Saturated steam is supplied through the steam injector pipe 16 to maintain a temperature about 212°F at a super-atomspheric pressure. The screw conveyors 28 and 30 in the conduits 24 and 26 have as their purpose the determination of the rate of progression of the chips, so that the time of transit of the chips through the digester is under the control of the operator.

The discharge zone E of the digester contains a vertical pipe down which chip-forms freely fall from the screw conveyor 30. In so falling the chips encounter (in zone F) a cushion of a fluidized suspension of chips, chip fragments, shives and fiber bundles. This suspension is annular in shape and is produced by intense agitation and turbulence, generated by means of the impeller 46. High-speed rotation of the impeller causes the chip-forms to be broken along their lines of cleavage into fragments or shives, and those fragments in turn are further broken down into fiber-bundles or slivers, all without cutting. This is accomplished by the speed of the blades 48 which agitate the chips and direct them against the walls.

The suspension is impelled out through orifices 50. These orifices fragmentize the material furthur along its line of cleavage. The diameter of the screening orifice is under the control of the operator by means of the handle or lever 56.

From the orifice, the discharged susupension is conducted through the emission conduit 58 of increasing cross-sectional area to be discharged into the atmosphere. This expanding emission conduit brings about a gradually-decreasing pressure on the suspension so that when the pulp fibers reach the atmosphere, no force is exerted on them which would tend to explode or otherwise degrade them.

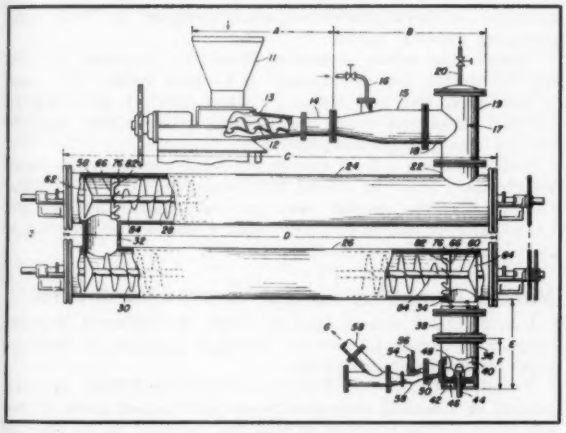


Fig. 3

As shown schematically in Fig. 3, the plug P of chips leaving a conduit such as 24 encounters the toed-in fingers (82), which undercut the plug peripherally at U, leaving (extending from the plug) a boss-like portion B. The boss then has space in which to expand and disintegrate outwardly. In this way, the chips are evenly fed from one conveyor to the next.

Digestion apparatus

U.S. 2,823,118, issued Feb. 11, 1958, to Albert D. Merrill, assigned to Chemipulp Process Inc., describes certain improvements in hot acid systems employed in the production of pulp.

It has been the practice in the normal operation of a sulfite mill to release cooking liquor from the digester in order to lower the pressure. The side relief has been delivered through the high-pressure relief line into the high-pressure accumulator. The side relief liquor contains a substantial amount of organic matter that contaminates the cooking liquor in the high-pressure accumulator. Thus, when the acid in the high-pressure accumulator is subsequently used to fill the digester or other digesters, these organic elements are carried into the next cook. The cooking acid containing material amounts of organic matter provides impure acid and is detrimental to subsequent cooking. Such contaminated cooking liquor tends to reduce the quality factor of the pulp—such as the tearing strength, the folding endurance and the bursting strength. In addition, the cooking liquor contaminated by the

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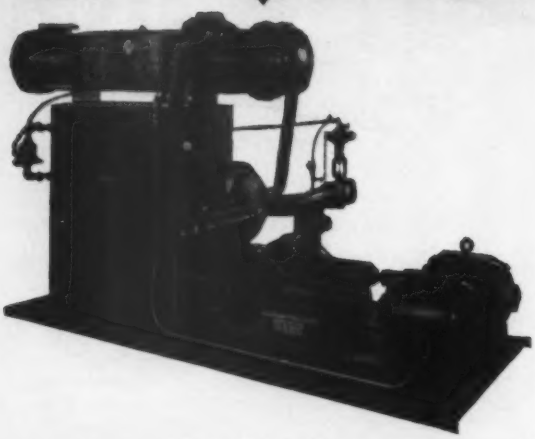

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organic matter also tends to reduce the yield of pulp, and the system requires more sulfur to properly cook a given quantity of cellulosic material. It has, therefore, been necessary to periodically empty and flush out the high-pressure accumulator several times during each year of normal operation.

An object of the present invention is to provide an improved method of handling the side relief to prevent the accumulation of organic matter as well as water solubles in the accumulator, to preserve the acid strength and to provide for an increased yield of higher-quality pulp.

Apparatus is provided for delivering the side relief from the digester into a side relief storage tank, as distinguished from the accumulator, to avoid contamination of the cooking liquor and at the same time to employ the side relief liquor as a continuous spray in a degassing tower under pressure so as to remove and reclaim substantially all of the free sulfur dioxide contained in the side relief—providing a saving in the sulfur required for each unit of pulp cooked.

Making dimethyl sulfide from pulp mill spent liquors

U. S. 2,816,832, issued Dec. 17, 1957, to Merle E. Cisney and James D. Wethern, assigned to Crown Zellerbach Corp., describes a process for making dimethyl sulfide from spent liquors.

Spent liquor from the alkaline pulping of lignocellulose and having a pH of at least 10 is treated with up to 15 per cent elemental sulfur at 180-300°C under pressure for 3-60 min., producing dimethyl sulfide.

The dimethyl sulfide is removed by venting the vapor from the reaction mixture into a condenser in a closed system. The vapor is condensed and provides a two-phase product consisting of dimethyl sulfide and water. The dimethyl sulfide is then separated and fractionally distilled to purify it.

Yields of about 1-2 per cent of the solids content of the liquor are obtained. Thus, in a kraft mill producing 400 tons of paper pulp per day this process would produce about 30,000 lbs. per day of dimethyl sulfide at a cost which is only a small fraction of the current price (about $1.00 per pound).

Method of making a paper-covered hardboard

U.S. 2,832,267, issued April 29, 1958, to William J. Runckel, assigned to Oregon Lumber Co., describes a method of making a paper-covered hardboard product.

Broadly stated, the hardboard product of the present invention consists of a base of defiberized wood, with surface layers of porous paper having a weight of 3-20 lbs. per 3000 sq. ft., the base and the paper surface layers having been consolidated and welded together by the application of heat and pressure. This product is produced by a method that consists of forming a slurry of comminuted lignocellulose in water; forming the slurry into a mat; applying to the surface of the mat a porous paper weighing 3-20 lbs. per 3000 sq. ft., the moisture content of the mat and the porous character of the paper cooperating to unite the two adherently, and then hot pressing the resulting assembly to form the finished product.

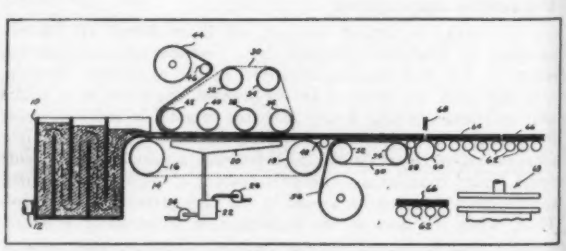

Fig. 4

Suitable apparatus for carrying on the presently-described method is illustrated in Fig. 4. The aqueous slurry, with or without added size and binder, is introduced at a consistency of 1-5 per cent into the headbox 10 through conduit 12. After passing between

the baffles of the headbox it traverses the apron and flows out on the forming wire 14. The latter may be of the conventional fourdrinier type and is supported by rolls 16 and 18 driven at a suitable rate. A suction box 20 communicating with a reservoir 22, a liquid pump 24 and a vacuum pump 26 is positioned beneath the forming wire.

Another wire 30, supported and driven by rolls 32, 34, 36, 38, 40 and 42, cooperates with the lower wire in forming the mat. It also is used for applying a paper sheet to the upper mat surface. Thus, porous paper on a rotatably-mounted roll 44 is passed over a guide roll 46 and then to the stretch of wire 30 between rolls 32 and 42. The paper is carried by wire 30 to the upper surface of the felt. There it is wetted by the wet felt and adherently united thereto by a water bond.

If desired, paper also may be applied to the under surface of the felt. This is accomplished by passing the felt, now partially dried, over the transfer roller 48 and onto the conveyor 50. The latter conveyor is supported and driven by rolls 52 and 54. It moves at a rate that is the same as the rate of movement of the wires 14 and 30. Rotatably-mounted beneath it is a roll of paper 56, the paper sheet being transferred over roll 52 onto the conveyor. Here it comes in contact with the wet lap, by which it is soaked with water and to which it is adherently united through a water bond.

The resulting laminated assembly then passes over supporting rollers 58 and 60 and the roller chain assembly 62. It is cut in sections 64 and 66 by the saws illustrated schematically at 68. These are then transferred to the press 69 and pressed to form a finished board product.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Carton	Diamond Match Co.	2,824,684	2/25/58
Method of cooking sulfite pulp	Aktiebolaget Rosenblads Patenter	2,824,800	"
Carbon paper	Thilmany Pulp & Paper Co.	2,824,815	"
Method of testing paper for dust	S. D. Warren Co.	2,825,225	3/ 4/58
Apparatus for producing and debarking wood chips	William O. Forman	2,825,371 & 3	"
Paper machine hood	Ross Engineering of Canada Ltd.	2,825,430	"
Display stand	West Virginia Pulp & Paper Co.	2,825,519	"
Waterproof fiberboard	Armstrong Cork Co.	2,825,660	"
Apparatus for defiberizing bagasse	Gruendler Crusher & Pulverizer Co.	2,825,935	3/11/58
Scraper blades for paper stock screening machines	Cowles Co.	2,826,126	"
Machines for making paper boxes	Henry Russell Davis Jr.	2,826,127	"
Elastic packing paper	Societa per Azioni Fabbriche Fiammiferi ed Affini	2,826,239	"
Cigarette package	Harry Janson	2,826,295	"
Package for sliced bacon	Charles D. Mullinix	2,826,296	"
Carrying handle for tied-together containers	American Can Co.	2,826,299	"
Container with sanitary pouring surface and protecting barriers	American Can Co.	2,826,348	"
Milk carton	Marathon Corp.	2,826,349	"
End closing carton	Richardson-Taylor-Globe Corp.	2,826,350	"
Ice cream receptacle	American Box Board Co.	2,826,351	"
Manufacture of wet-strength paper	Hercules Powder Co.	2,826,500	"
Apparatus for detecting lumps in paper webs	Champion-International Co.	2,826,911	3/18/58
Die for cutting box blanks	Floseal Corp.	2,826,968	"
Box fabricating mandrel	Crown Zellerbach Corp.	2,826,969	"
Press for removing water from paper pulp	Maschinenfabrik Andritz Actiengesellschaft	2,826,986	"
Combination shipping and display container	Owens-Illinois Glass Co.	2,827,162	"
Paperboard wrapper for cans	Mead-Atlanta Paper Co.	2,827,165	"
Bottom closure assembly for containers	Sealright-Oswego Falls Corp.	2,827,218	"
Container insert	George C. Sparks	2,827,219	"
Cartons	David Levkoff et al	2,827,220	"
Partitioned carton	Alford Cartons	2,827,221	"
Covered boxes or cartons	Sutherland Paper Co.	2,827,222	"
Manufacture of fibrous structures	Fibrofelt Corp.	2,827,668	3/25/58
Apparatus for chipping wood	Jackson Industries Inc.	2,827,934	"
Self-leveling, storing and dispensing apparatus	American Machine & Foundry Co.	2,828,006	"
Folding carton	United States Printing & Lithograph Co.	2,828,008	"

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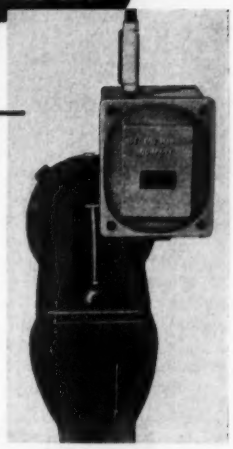

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FOREIGN ABSTRACTS

Swedish turpentine; terpene hydrocarbons from sulfate turpentine

A literature survey is given on the composition of various turpentines obtained from Swedish spruce and pines. Included are some of the latest data on the physical constants of the more important terpene hydrocarbons.

The author studied qualitatively and quantitatively the terpenes present in Swedish sulfate turpentines by means of gas-phase chromatography and designed a preparative gas phase apparatus for this purpose, which is illustrated and fully described. This was used in separating sulfate turpentines into a continuous series of fractions, the components of each of which were identified by means of infra red spectra and the amounts of which were determined. Unless suitable packing materials are used, some terpenes like alpha-pinene (termed 2-pinene) is readily isomerized. Hence, a study was made of various packings—the best of which were either dibenzylpyridine alone or a microcrystalline wax (consisting of higher naphenes, melting at 73-76° C) containing 5 per cent dibenzylpyridine. In the resolution of a turpentine, these two packings serve to complement each other. The foreruns of sulfate turpentines, especially those in the blow-gases from a cook, contained methyl mercaptan, dimethyl sulfide and dimethyl sulfide, which were thus removed before the actual hydrocarbon analyses were made.

	A	B. u.	B. n.	C. u.	C. n.
% 2-Pinene	54.3	58.1	55.5	53.3	51.4
» Camphene	2.2	3.1	1.6	1.8	1.7
» 2(10)-pinene ...	3.5	4.9	5.0	6.7	6.3
» 3-Carene	32.9	25.6	28.7	32.1	33.3
» Limonene	2.4	3.2	3.7	2.3	2.8
» X_6	0.6	0.6	0.7	0.4	0.6
» p-Cymene	0.7	2.8	3.1	1.1	1.2
» Terpinolene	3.4	1.7	3.7	2.3	2.7
Total	100.0	100.0	100.0	100.0	100.0

Fig. 1

A series of gas chromatograms show the peaks obtained from the fractionated turpentines. The table given shows the composition of various pine products. "A" represents the composition of a turpentine obtained by the steam distillation of undried Swedish pinewood (erroneously this is termed "spruce" in the table). "B_n" and "C_n" represent respectively the blow-gas turpentines formed commercially in two different kraft mills, and "B_u" and "C_u" represent the turpentines found in the relief gases from these same mills. Here 2(10)-pinene equals beta-pinene, and X_6 is an unidentified fraction. Evidently the principal terpene components from Swedish pine turpentine (either from the sulfate cooks or from the wood) are 2-pinene and 3-carene; they account for over 80 per cent of the terpenes. In the case of a spruce turpentine, the principal components are 2-pinene (58 per cent) and 2-(10)-pinene (25.4 per cent). Minor components include 4.5 per cent limonene, 3 per cent camphene and possibly small amounts of 3-carene and 1-(7), 2-p-menthadiene, as well as traces of two other unidentified components.

Two tables, 15 figures and 44 references are included. Arne B:son Groth. *Svensk Papperstidn* 61, 311-321 (1958) (in English).

Cellulose nitrate and butylamine

Cellulose nitrate from cotton linters containing over 13 per cent nitrogen and with a degree of polymerization of 1800 reacted rapidly with n-butylamine and dissolved quickly. If a small amount of the amine is poured on the nitrate the reaction is explosive. Other amines appear to react very similarly. Butylamine could also dissolve cellulose nitrate that was insoluble in acetone or in other organic solvents.

The following nitrates were also dissolved by the amine: those formed from celluronic acid; those made from linters having crosslinkages; those formed from extractive-free wood, and those formed from such wood after oxidation with nitrogen dioxide. Even the lignin component of the nitrated wood entered solution rapidly. When the butylamine is well cooled and stirred and the cellulose nitrate is added gradually, a viscous yellow solution is formed and may be kept without change for 24 hrs. at 0°C (In making the solution, any overheating causes much darkening). The yellow reaction product can be separated from the solution by adding acetic acid to pH 5. The product is then soluble in acetone and certain other organic solvents. It is almost insoluble in dilute acids and bases. The compound can also be precipitated from its solution by means of ether, heptane or dimethylsulfoxide. The yellow product contains one butylamino group and one nitrate group for every glucose unit of the cellulose and has a unit weight of 278. This is a preliminary report.

Ermo Kaila. *Paper and Timber* (Finland) 40, 339-40 (1958) (in English).

Separation of methanol lignin

The wood (*Eucalyptus regnans*) was ground to a meal and extracted with methanol at 150°C during the course of 56 hrs. After the first 8 hours the methanol was changed, and each of 16 hrs. thereafter a new batch of solvent was used. The final filtered solution was poured into water and the precipitate dried *in vacuo*.

This crude lignin was then chromatographed both on plain and on borate paper, first in one dimension and finally on a didimensional chromatogram. Full details are given. Three lignin-like substances were separated; one of these appeared to be degraded, and besides lignin, vanillin, syringaldehyde, sinapaldehyde and various other products were present in the original crude mixture. However, two substances that gave the lignin phloroglucinol test

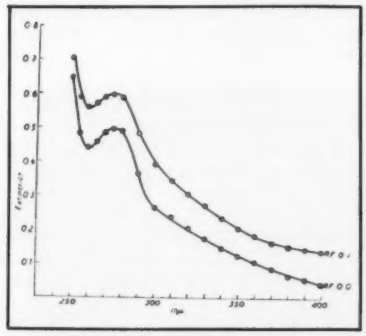


Fig. 2

and the usual ultraviolet absorption spectra for hardwood lignins were isolated (Fig. 2). These showed very different R_f values on the chromatograms. Thus, the original methanol lignin is believed to be a group of substances, including lignin, on which various degradation products are adsorbed.

No analytical data are included. Yield figures are not given. Fifteen references. David E. Bland. *Holzforschung* 12, 19-23 (1958) (original in English).

Compression wood of Pinus radiata as papermaking raw material

The authors investigated the pulping and papermaking properties of 100-per cent compression wood taken from two trees of Monterey pine (*Pinus radiata*) and compared the results with those obtained with normal wood from the same tree or from another tree of the same species (that contained no compression wood). All these samples were subjected to the same cooking conditions and gave shive-free pulps. The compression wood pulps cooked by the kraft process were less completely delignified than were the others, and they were also somewhat inferior in yield and in certain strength properties than were those made from normal wood, irrespective of whether this was from wood in other areas of the same tree or from another tree.

However, the authors conclude that since the amounts of compression wood that would enter the usual cook are not too

great, they would not cause great reductions in either yield or pulp strength. This was confirmed by mixing pulps prepared from 100-per cent compression wood with that from a normal wood. The properties of sulfite pulps made from compression wood showed the greatest losses in strength. Even "normal" wood from the tree carrying compression wood reacted adversely, apparently due to the presence of "acid-susceptible wood", which contained zones of very small compression failures and slip planes. Such wood was frequently found in the neighborhood of or on the opposite side of the tree from the compression wood.

Chemical analyses of the wood and pulps, strength properties and photomicrographs are included. There are 23 references. A. J. Watson and H. E. Dadswell. *Appita* (Australia) 11, 56-69, with discussion 69-70 (1958).

Micro-mercury determinations in groundwood pulps

A photometric method was developed for the very rapid determination of microgram amounts of mercury, so that an individual determination can be made within 7 min.

The mercury is vaporized by combustion of the sample in a Grote-Krekeler combustion tube. The gases resulting from this treatment are collected over water in a glass bottle of known volume. The mercury content of these gases is then measured by means of a commercial mercury vapor meter. It is essential that there be a high moisture content in the combustion gases in order to obtain good precision. When the gases are too dry, results will be low—probably due to adsorption of mercury on the glass walls of the measuring bottle. Thus, the initial pulp sample must be moistened prior to the combustion.

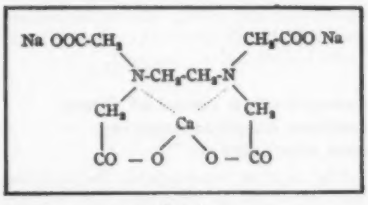


Fig. 3

The results obtained with the new procedure compare quite favorably with those obtained with older more elaborate techniques. Full details are given, and results are expressed in terms of grams of mercury recovered per ton of pulp.

One table and seven figures are included. Erik Bilberg and Per Landmark. *Norsk Skogind*, 12, No. 4, 147-151 (1958), (in Norwegian with brief English summary).

Ultraviolet reflectance as a measure of pulp delignification

The reflectances of pulp sheets (from both sulfite and sulfate pulps) at about 286 millimicrons were compared with the corresponding lignin contents and also with the TAPPI permanganate numbers. The purpose of this study was to use the reflectance as a possible means for measuring the degree of delignification of the unbleached pulps.

Measurements of the reflectances of air-dried sulfite pulp sheets indicated that there were possibilities in the use of such a method, provided handling of the pulp and the sheet preparation are standardized. In order to expedite the determination, drying in air could be replaced by high-pressure drying. Unfortunately the method does not seem to be applicable to kraft pulps because of the low intensity of the reflectance, at least with the present measuring devices in use at the Institute of Technology in Helsinki (*i.e.* a Beckman DU apparatus). The amount of resinous material usually present in a pulp does not interfere with the measurements.

One table, eight figures and nine references are included. Paavo Kajanne, Olavi Perila and Matti Tuominen. *Paperi ja Puu* (Finland), 40 No. 4a, 147-152 (1958), (in English).

The process of fiber separation

These are the abstracts of two related articles. In Part I, untreated and partially delignified shavings and radial sections of *Eucalyptus regnans* wood were subjected to chemical and mechanical treatments, with a view towards obtaining knowledge of the processes required in the separation of fibers. Direct mechanical defibration of the wood caused very extensive damage to the fibers, together with debris formation. Pretreatment with alkali made it easier to separate the fibers and reduced their damage. By causing initial partial delignification, then following this by treatment with alkali, the ease of fiber separation was increased. This was less noticeable when the alkaline treatments preceded such partial delignification. When partial delignification alone was used prior to mechanical treatment, there was no marked increase in the ease of separating the fibers from each other until more than 75 per cent of the lignin had been removed (by methanol at 150°C).

The authors conclude that when the lignin content of the fibrous material is very low (as in holocellulose) covalent bonds provide the major forces involved in the interfiber adhesion. Both acids and alkalies can cause the fission of such bonds, but the latter are more effective than are the former. The assumption seems to be that uronic acid ester bonds are mainly the sensitive ones (which can be severed by alkali). When these are severed, the controlling process in cell separation appears to be largely physicochemical in nature—such as swelling. The authors briefly discuss the importance of their findings to papermaking. Tentatively, they conclude that hydrolysis as well as delignification controls fiber separation.

In Part II the same authors describe the effects of the time of treatment, temperature, alkali concentration, chip size and the use of water-soaked and air-dry chips on the properties of cold soda semichemical eucalypts pulps. The chips from these various treatments were put through a Bauer defibrator, screened and converted into handsheets. For most of such pulps, the alkali consumption, pentosan and lignin percentages were determined. It was not a requisite that the chips be penetrated completely by the alkali; a satisfactory pulp could still be obtained without complete penetration, although it was shown that the more fully penetrated chips gave pulps which developed the best strength properties on beating. By using water-soaked chips or by operating at a higher temperature (than the 20°C usually used) more rapid penetration was obtained. The reduction of the size of chips gave rise to better penetration but had little effect on the pulp properties. For all the cold soda treatments, the pulp yields were roughly the same, namely about 85 per cent. Unless very drastic alkali treatments were used, the pentosan and lignin contents did not show great variations; usually about 21 per cent and 16-17 per cent respectively in the case of heartwood, and 24 per cent and 18 per cent in the case of sapwood.

The effects of treating wood with alkali are discussed briefly, and the suggestion is again made that the alkaline treatments weaken the chemical bonds which account for fiber adhesion. This factor, rather than the relatively small amount of lignin that is removed by cold alkali, allows the chips to be defibered mechanically without undue damage.

C. M. Stewart, A. J. Watson and H. E. Dadswell. *J. Australian Pulp and Paper Industry Technical Association* 11,112-123 (1958) and 145-155 (1958). In Part I there are 19 references, one graph and four plates (which include altogether 36 photomicrographs). In Part II there are eight references, five tables and four photomicrographs.

Papyrus, bamboo and tropical woods in papermaking

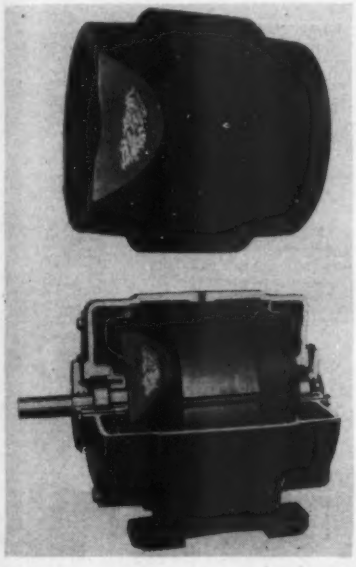
This is a contribution from the Laboratoire Recherches Chimiques, Tervuren, Belgium. Various species of papyrus, bamboo and hardwoods from the Belgian Congo were examined.

Papyrus was found to be unsuited to papermaking because, after pith removal, the yield of unbleached pulp (based on the green weight of the raw material) was only 7 per cent. Dwarf bamboo was not suited to pulping, but bush bamboo (*Bambusa vulgaris*) gave satisfactory pulps that had a relatively high tear resistance.

The author summarizes the results of comprehensive anatomical and chemical studies of the various deciduous tropical woods. When these were pulped individually using 18-20 per cent active alkali and 25 per cent sulfidity, the pulps were usually inferior in quality to those of the kraft pulps from Scots pine. When the hardwoods were mixed and then pulped, the products showed about 90 per cent of the tear, 85 per cent of the tensile strength and 80-85 per cent of the burst shown by commercial pine pulps. The tropical wood pulps could be bleached easily to about 86 per cent brightness; their properties were comparable to those of coniferous sulfite pulps. J.R.Istas. *Assoc. tech. ind. papetiere*, Bull. No. 1 (1958) 19-36 (in French) through *C.A.* 52, 12393 (1958.

NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.



Epoxy resin cast motor stators

By completely casting open-type motor stators in an epoxy resin, Allis-Chalmers Mfg. Co. has produced an addition to the Super-Seal line that features complete protection for the insulation system.

This insulation system can be used where moisture or contaminated atmospheres could destroy the effectiveness of conventional systems previously protected by special enclosures. The company states that motor applications include the most severe conditions of outdoor service. *Allis-Chalmers Mfg. Co.*

Circle No. 11 on Readers' Service Card

Differential pressure transmitters

Fischer & Porter Co. has greatly expanded its line of force-balance differential pressure transmitters featuring the exclusive construction in which measuring circuits are completely immersed and sealed in silicone oil.

Units for level measurement and units for the measurement of differential pressures of 0-20 in. to 0-200 in. and 0-30 in. to 0-300 in. are now available. Transmitters are available either with or without adjustable zero suppression. *Fischer & Porter Co.*

Circle No. 12 on Readers' Service Card

Plastic pipe

A new rigid plastic pipe that can be used at higher operating pressures and temperatures than any other thermoplastic plastic pipe is now available to the industry.

The pipe is made from an improved Kralastic resin developed by United States Rubber Co. The company states that the pipe can be used at temperatures as high as 180° F with tensile strength that allows working pressure ratings averaging 100 psi. *Carlon Products Corp.*

Circle No. 13 on Readers' Service Card

Multi-wall tuber

Newest of the Potdevin machines, a Model 62XS simplifies conversion of stepped-end, multi-wall tubes. This machine is called a "Perforaster Tuber", because each web is both perforated and cross-pasted simultaneously in individual stations within two stacks.

The machine automatically produces from 150-300 tubes per minute. It produces bags in variable sizes from 10 - 26 in. in width, to 20 - 54 in. in length. *Potdevin Machine Co.*

Circle No. 14 on Readers' Service Card

Two-way radiophone

Motorola has announced a new mobile, two-way radiophone operating in the 450-470 MC. frequency band. Featuring a transistorized power supply and an advanced unified chassis design, the new unit provides greater reliability and operational benefits than ever before possible with equipment in this frequency range.

The new unit weighs 34 lbs. and is packaged in a 30-per cent narrower 10-in. housing, enabling both under-dash and truck mounting. *Motorola Communications & Electronics Inc.*

Circle No. 15 on Readers' Service Card

Antifoams

Two new antifoams that are said to be fast-acting and highly effective foam killers for industrial use have been placed on the market.

"SAG" 47 silicone antifoam fluid for non-aqueous systems is a 100-per cent solids solution that can be used at full strength or as a solvent solution or blended with other materials.

"SAG" 470 silicone antifoam emulsion for aqueous foam systems contains 10 per cent silicone solids by weight and is ready for use but can be further diluted if desired.

The company is offering 8-oz. samples if it is desired to evaluate these new silicone antifoams. *Silicones Div., Union Carbide Corp.*

Circle No. 16 on Readers' Service Card

All-polyethylene acid pump

The unique pump pictured above is a safe, convenient and contaminant-free way of handling corrosive liquids.

The pump is called the "SAF-T-PUMP". It screws onto any standard 5-pint acid bottle. Attached to the pump body are a siphon, a spout and a 4-oz. squeeze bottle. Once screwed onto the bottle, the pump delivers acid at the rate of 1000 ml/min. with just light, rapid squeezes of the squeeze bottle. There is no after-drip from the spout. A relief-valve button stops the flow. *Fisher Scientific Co.*

Circle No. 17 on Readers' Service Card

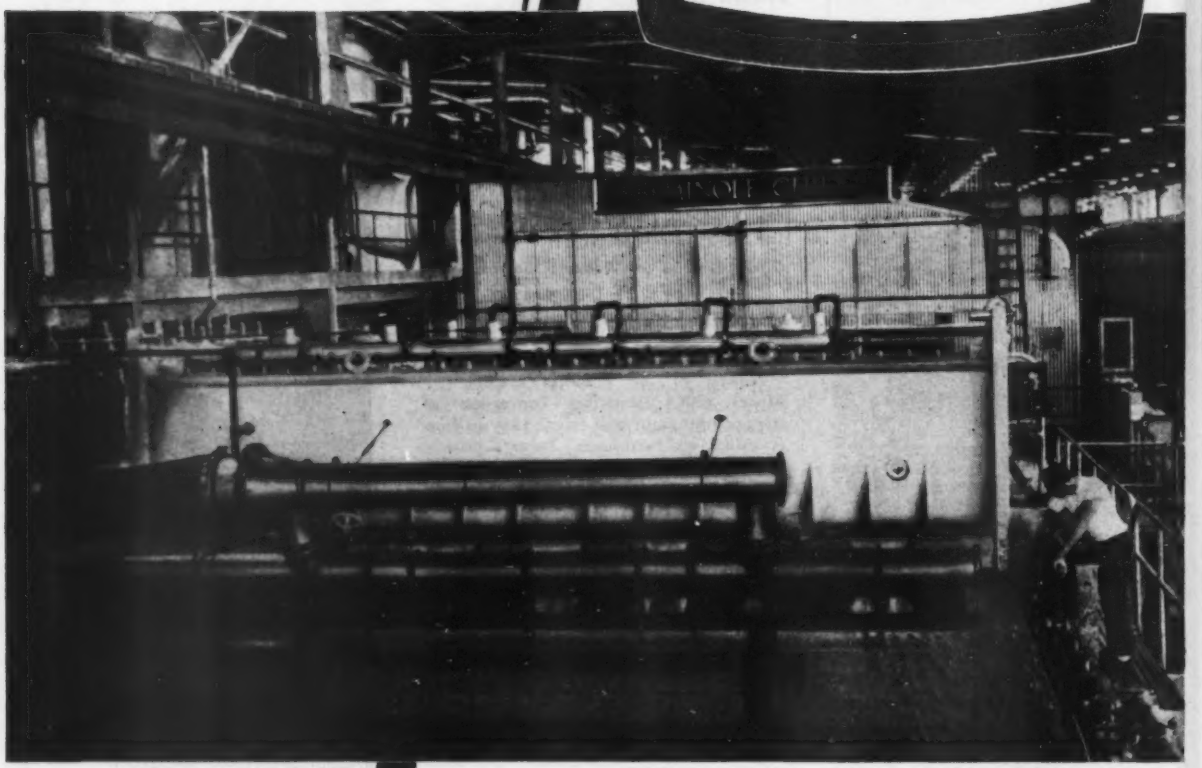
System for liquid heating of paper machine dryers

Arrangements have been completed under which Beloit Iron Works and S. Morgan Smith Co. will cooperate in providing a new, patented system for liquid heating of paper machine dryers.

This system of heating can be used in Yankee dryers as well as in ordinary paper

Another
pressure secondary headbox by . . .

VALLEY



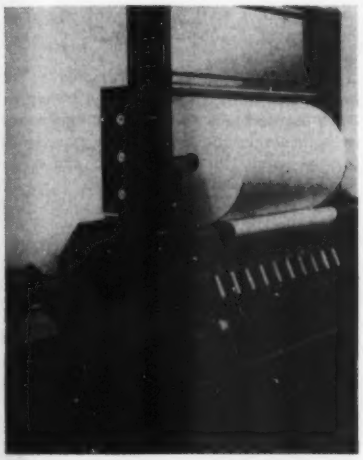
On . . . . St. Regis Paper Company's new giant paper machine at Jacksonville, Florida.

VALLEY IRON WORKS CO., APPLETON, WISCONSIN

New Products . . .

dryers and permits reaching materially higher levels of heat transfer without the hazard of maintaining high operating pressures inside the dryer shells. *Beloit Iron Works.*

Circle No. 18 on Readers' Service Card



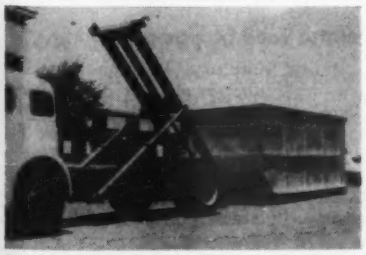
Drum winder and slitter

This new machine (model SR-60) is said to be capable of slitting paper, paperboard, coated fabrics, etc. as narrow as a quarter of an inch.

Web sizes on the new machine vary from 36 - 125 in. The standard model will take parent rolls up to 48 in. in diameter. Optional equipment increases the capacity to 60 in.

Air-operated cutters are one of the features on the machine. They allow for simplified adjustment to insure equal pressure at all points while operating. The new slitter can be equipped with virtually any type of electrical or mechanical drive for a variety of applications. *Doven Div., Appleton Machine Co.*

Circle No. 19 on Readers' Service Card



Detachable containers for use in materials handling system

Detachable containers (up to and over 40 cubic yards capacity) are employed in a new system of materials handling just developed by Dempster Brothers. The new invention is called the Dempster-Dinosaur.

Primary use of the Dempster-Dinosaur in the paper industry will be for handling large accumulations of waste materials such as bark, beater pulp, slaker lime grits, ashes, core butts, general rubbish and salvable scrap. However, the firm is in the process of developing big-capacity, stake-type containers for handling logs; enclosed water-tight, tank-type containers for handling chemicals, liquid wastes, slurry and sludge, and cargo-type containers for chips, raw materials and finished product handling.

The company welcomes your request for additional information on this new system. *Dempster Brothers.*

Circle No. 20 on Readers' Service Card

New design service for equipment

Haveg Industries Inc. announces a new design service for heat exchangers, falling film absorbers, towers and chlorine coolers. The company states that the process engineering, fabrication of the equipment and guarantee performance to the customer's specifications is all included in this service.

A complete description of this service is given in a bulletin now being offered by the company. *Haveg Industries Inc.*

Circle No. 21 on Readers' Service Card

Compound for wet end wash-ups

Magnus 94XXK is a new low-foaming, non-dusting compound for cleaning of the wet end of paper mill systems, stock filters, screens and suction press rolls.

The compound is harmless to felts, yet its solutions are highly penetrative and quickly loosen and disperse heavy soils. Magnus 94XXK is a granular, light buff colored cleaning compound that is readily and completely soluble in hot or cold water. *Magnus Chemical Co. Inc.*

Circle No. 22 on Readers' Service Card

Portable two-way communications unit

To facilitate both in-plant and outdoor radio communication, a new portable two-way communications unit has been designed. The company states it is the first equipment of its type with a tubeless receiver. The same type of transistorized transmitter-receiver will be used by police departments, etc. *General Electric Co.*

Circle No. 23 on Readers' Service Card

Method for determining the wet adherence of supported films to various bases

A new method for determining the wet adherence of supported films to various bases has been developed.

The technique has so far been used only with emulsions applied to photographic film and paper, but it could also be valu-

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New Electronic Moisture Registers have first "built-in standard" in a 3-second, portable moisture tester.

NOW DIAL ACCURACY IS ASSURED, even under the extremes of production-line use. With *self-checking standard,* Moisture Register's new Model 5's are checked and adjusted for calibration accuracy right on the job—by any untrained operator. He simply fits electrode to standard. Then with new trimmer he sets dial for perfect alignment. Gives calibration adjustment *in the field.* You get practical accuracy down to 0% . . . 3-second spot tests for moisture wherever your product may be. Portable, light weight, battery operated, new rugged construction with miniature tube. Factory-set to your needs.

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- Paperboard
- Insulation boards
- Paper Bags
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New Products . . .

able in measuring a variety of coating materials and coated products such as organic coatings, protective and decorative papers, plastics, etc.

The method employs a pebble mill charged with a specified amount of pebbles and fine quartz abrasive in water. A certain number of exposed film or paper samples is placed in the mill and abraded for several minutes. The samples are then placed in an optical densitometer to determine photometrically the per cent of emulsion area removed. *Eastman Kodak Co.*

Circle No. 24 on Readers' Service Card

Stainless steel screw conveyors

Screw conveyors that are used to cook wood chips in a continuous digester are now being made of stainless steel.

Stainless steel conveyors have been found to solve the problem of corrosion. Type 316 Armco stainless steel conveyors are reported to have been in service more than seven years in pulp mills with no sign of failure from corrosion or abrasion. *Armco Steel Corp.*

Circle No. 25 on Readers' Service Card

Rotary compressors

A new line of positive-displacement rotary compressors that rivals the efficiency and stability of reciprocating machines while matching the compactness and low maintenance of centrifugals has been announced.

The new compressor is designed for continuous heavy-duty industrial service handling air, gas or vapor. With a standard capacity range of 800-13,000 cfm, it is expected to have wide application in the process industries. *Fairbanks, Morse & Co.*

Circle No. 26 on Readers' Service Card

Single-stage, centrifugal compressor

The development of a single-stage centrifugal compressor built in a barrel-type casing has recently been announced.

The new unit can operate at a working pressure up to 500 psi. It was developed for applications in plants where it is desirable for existing applications, including recirculating high-pressure gas for cooling and for processing. *Allis-Chalmers Mfg. Co.*

Circle No. 27 on Readers' Service Card

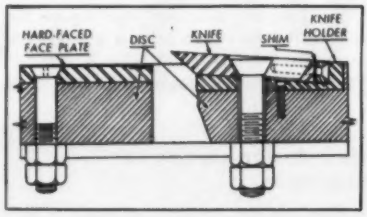
Dispersant for pitch in paper mills

An improved pitch dispersant for paper mill systems using sulfite, semichemical or groundwood pulps has been developed.

This rapidly-dissolving product, called Nopcosant, is in the form of tiny uniform beads that are lighter in color, dust-less and have pH closer to neutrality than do similar products.

Nopcosant also stabilizes rosin size against premature coagulation and acts as a mordant for basic dyestuffs. It also helps to control the growth of slime flora and enhances the flow properties of stiff paper coatings. *Paper Chemicals Div., Nopco Chemical Co.*

Circle No. 28 on Readers' Service Card

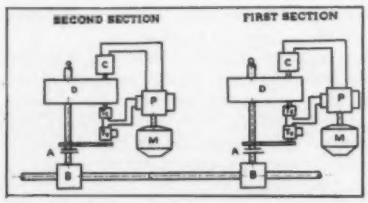


Knife assembly for slab chipper

A new knife assembly, wherein the knives are mounted in knife holders, has been announced by Carthage Machine Co. for its 47-in. slab chipper.

This new assembly offers many advantages such as: to change chip length all that is necessary is to change the knife holders; knives can now be shimmed in the shop and are therefore the correct width when placed in the disc, eliminating field shimming. *Carthage Machine Co.*

Circle No. 29 on Readers' Service Card



Differential hydraulic drive for papermaking machines

A new type of differential hydraulic drive for papermaking machines is now being offered to the paper industry.

In viewing the diagram above, line shaft L drives differential gear D through bevel gear B and clutch A. Output shaft O of differential gear D is connected to the drive shaft of a paper machine section.

Speed of the section is controlled by varying the displacement of hydraulic pump P and thereby the speed of hydraulic motor C. Variable tachometer Tv is driven by gear D's input shaft. Constant tachometer Tc is driven by hydraulic motor C. Pressure variations in the loop connecting tachometers Tv and Tc control the displacement of pump P, thereby controlling the speed of motor C, and through motor C the speed of output shaft O.

In this arrangement the speed of motor C is referred to line shaft L through tachometer Tv.

Variable tachometers Tv may be driven by synchronous motors, in which case speed is referred to the frequency of the power supply.

The company states that with this drive slack can be taken up in all sections of the paper machine, and extremely accurate draw control can be easily achieved. *Pusey & Jones Corp.*

Circle No. 30 on Readers' Service Card

Rotating water union

A new rotating water union that substantially increases wear life features flame-coated ceramic seats that virtually eliminate corrosion as a source of trouble in water union operation.

The new union can be adapted to all high-speed rollers and drums wherever water is used as a coolant. The unit comes in both single and double flow types with ½-, ¾- and 1-in. pipe thread and 1- to 14-in. machine thread. *Roms Inc.*

Circle No. 31 on Readers' Service Card

Temperature control valve

The OPW-Jordan temperature control valve now incorporates Teflon-impregnated asbestos stem packing. This packing is inert, durable and trouble-free, states the company. Resulting in easier valve stem movement, it allows diaphragm power to be transmitted more accurately to the sliding gate seat.

Valves are available in ¼ in. through 2 in. in size; 125 WSP cast iron and 250 WSP bronze bodies. *Jordan Industrial Sales Div., OPW Corp.*

Circle No. 32 on Readers' Service Card

Hot melt adhesives in granular form

A granular form of hot melt adhesives has been developed and is said to be especially suited for bag seaming and straight line gluing and other gluing operations.

The manufacturer states that the new granular form adhesives in combination with an extruder permit a manufacturer to closely control the quantity of activated material. *National Starch Products Inc.*

Circle No. 33 on Readers' Service Card

White core plastic pipe

A new white core plastic pipe has gone one step further in plastic piping to guarantee non-toxic conditions by using a 100-per cent virgin core material without the addition of carbon black.

The company welcomes your request for a bulletin that gives complete specifications on this new piping. *Quaker Rubber Div., H. K. Porter Co. Inc,*

Circle No. 34 on Readers' Service Card

High-activity flocculant

Separan NP20 is a new high-activity polyacrylamide-type flocculating agent. It is a synthetic, organic, water-soluble, high-

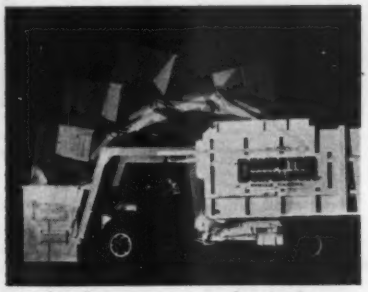
New Invention Cuts Waste Disposal Costs By Two-Thirds for Volume Paper Producers

Industry Cost Averages May Be Lowered Soon

If your plant is average, you're probably spending between .55 and .85 cents for every cubic yard of waste or trash moved to the disposal area . . . not including truck operation costs.

A recent development, the DEMPSTER-DUMPMASTER self-loading packer, promises to cut direct disposal costs to a new industry low of .07 to .16 cents per cubic yard for volume producers.

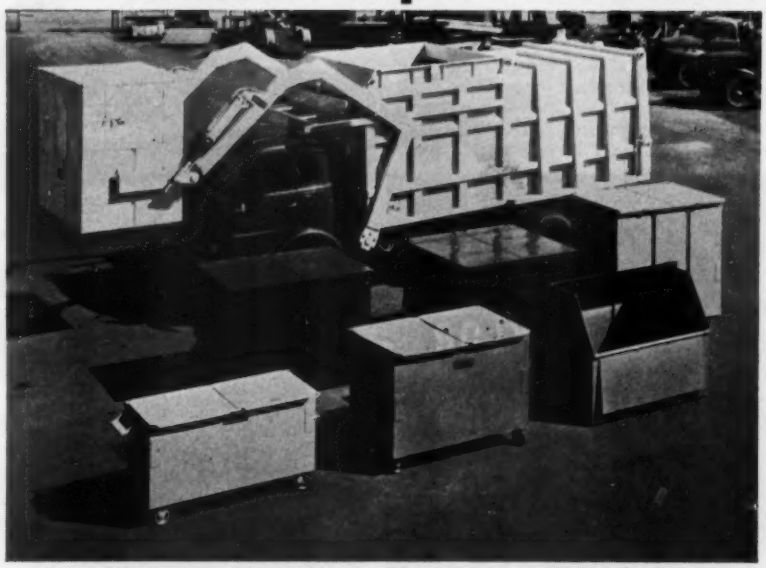
This new approach is an extension of the widely-established DEMPSTER-DUMPSTER System, in that it employs detachable waste storage containers. However, instead of carrying each container to the disposal area for dumping, the new machine empties many containers into its body, where the material is compacted to a fraction of its former volume. This permits per-trip payloads of 50 to 100 cubic yards of loose material, depending on its characteristics.



Multiple exposure photo shows dumping of 6 cu. yd. container.

How it Operates

The one-man Dumpmaster makes its rounds from container to container. Approaching, the driver engages lifting channels on the container's sides with the clearance arms. From controls in the cab, or remote controls at the front bumper, the container is lifted and rotated, discharging waste into the packer body. The material is hydraulically compacted while enroute to the next location. Containers may also be handled from docks or below grade. The safety clearance arms never pass the cab windows, eliminating possibility of driver injury.



The newly developed DEMPSTER-DUMPMASTER is shown with the seven basic containers it serves. Being hoisted is a 6 cu. yd. model. On ground are 1, 2, 3, 4 and 5 cu. yd. designs. Open container is used for hand-loading service.

New "Tracking" Caster Developments Make Plant "Container Trains" Practical

To whip the high cost of moving refuse outside, many plants are going to "container trains." Using special casters and couplers, eight to ten containers are towed by "plant mules" to inside generation points where an empty is dropped off and the full one is coupled on. Outside, the containers are uncoupled and automatically emptied by the waiting DUMPMASTER.

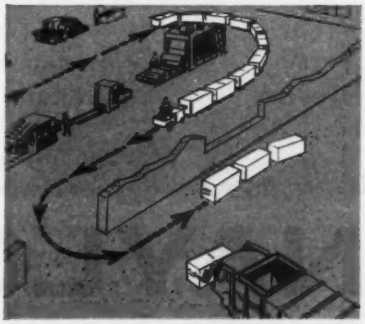


Diagram shows containers, in train, being hauled outside for emptying.

• • •

Many Designs Available

Standard and special-purpose containers, ranging from one through six cubic yard capacity, with or without casters, are available. The two cubic yard container above holds the equivalent of over 12 30-gallon trash cans.

Cost-Finding Book Offered

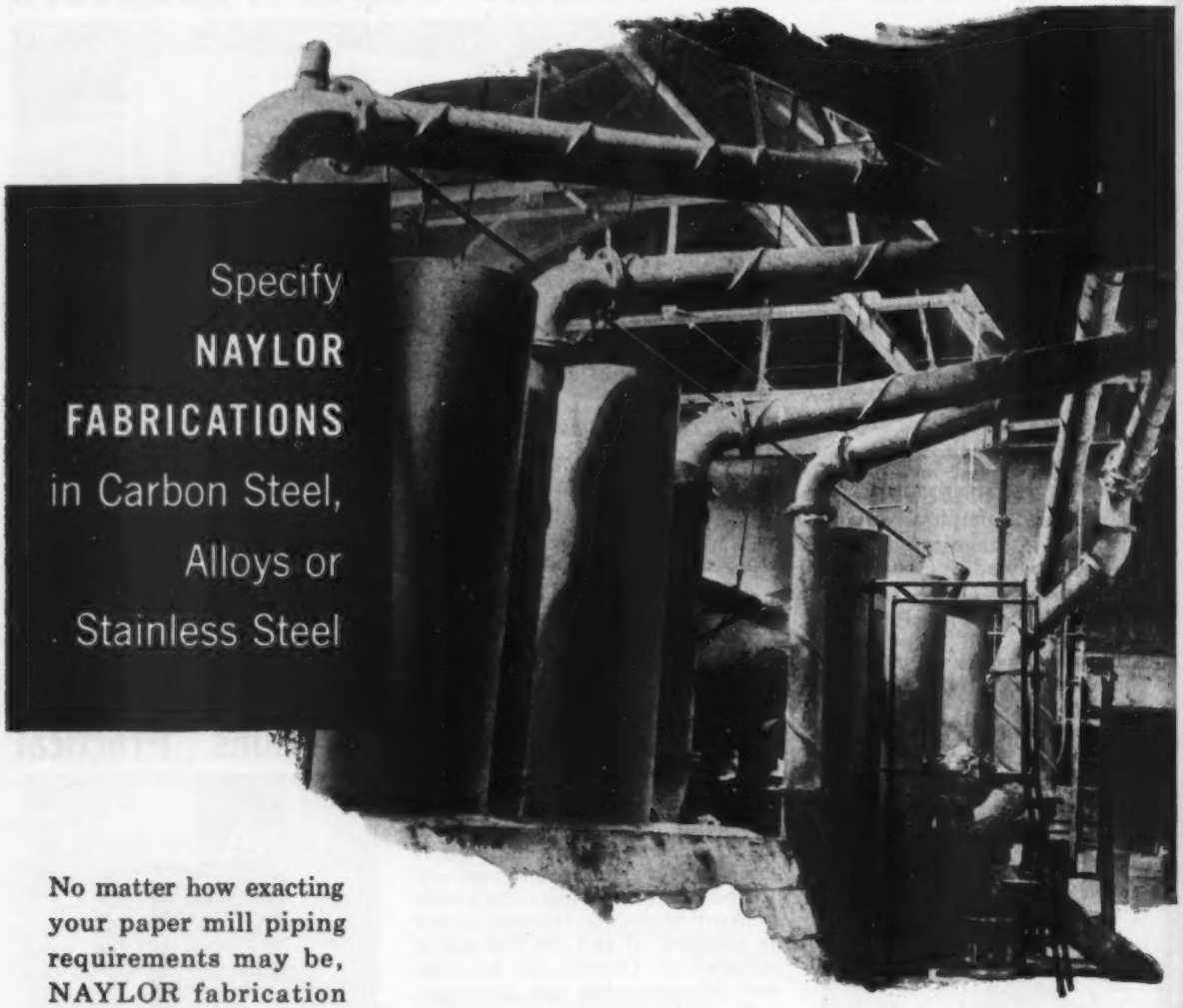
Write for the free 40-page book, "How to Cut Waste Disposal Costs," offered by the manufacturer. It contains cost-finding formulas, solutions to problems, case histories, industry average costs, etc. Equipment demonstrations arranged on request.

Mfd. by Dempster Brothers, Inc.

DEMPSTER BROTHERS

KNOXVILLE, TENN., DEPT. PI-9

FOR YOUR PIPING LAYOUT...



Specify
NAYLOR
FABRICATIONS
in Carbon Steel,
Alloys or
Stainless Steel

No matter how exacting your paper mill piping requirements may be, NAYLOR fabrication service can give you what you need economically.

NAYLOR spiralweld pipe is fabricated from carbon steel, alloys and stainless steel—in sizes from 4″ to 30″ in diameter, and thicknesses from 14 to 8 gauge. Standard fittings are available from stock. Special fabrications from 3″ to 44″ in diameter and wall thickness up to ⅜″.

Bulletins No. 507 and No. 525 tell the story.
Write for them today or send specifications for quotation.

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New Products . . .

molecular weight polymer that is manufactured as a white amorphous flake. It is also said to have uniform effectiveness over a wide pH range.

The new material is now available in commercial quantities from *Dow Chemical Co.*

Circle No. 35 on Readers' Service Card

Corrosion-resistant stainless steel pumps

Centrifugal and neoprene impeller-type pumps in stainless steel are now being produced for use wherever high resistance to corrosion is a factor.

The pumps will be available in ½-hp and 1-hp models rated at 10 and 25 gpm respectively. They will accommodate a temperature range from 35° to 150°F and will handle a wide variety of materials. *American Machine Products Inc.*

Circle No. 36 on Readers' Service Card

Hydraulic pump motor adapter

A new hydraulic pump motor adapter now makes General Electric's Tri-Clad '55 ac motors available as hydraulic pump motors.

The adapter fits on the end shield of the motors and permits the installation of almost any flange-mounted hydraulic pump directly on the motor.

Tri-Clad motors are available from 7½-125 hp and with standard ratings from 600 - 3600 rpm. *General Electric Co.*

Circle No. 37 on Readers' Service Card

Grease

An announcement has been made of a new industrial grease that has been developed especially for use in bearing applications where high pressures and shock loads exist. The company states that it is also effective where there is a tendency for corrosion to occur.

Identified as Gulfcrown Grease E. P., the new lubricant was formulated to meet severe conditions such as those occurring where loads have been increased above normal, on steel mill rolls, oscillating shafts, rotary kiln bearings, Banbury mixers, crushers, gears, cams, paper machine dryer frame supports, etc. *Gulf Oil Corp.*

Circle No. 38 on Readers' Service Card

Fire protection cut-off valve

A new fire protection cut-off valve has been introduced. The valve is essentially a modified bolted bonnet gate valve held open against two exterior springs by a small fusible link. These springs snap the valve shut when the fusible link reaches a melting temperature of 160°F, preventing the flow of liquid to fire areas.

Made of 316 stainless to resist both interior and exterior corrosion, they can be used at pumping pressures up to 150 psi. *Cooper Alloy Corp.*

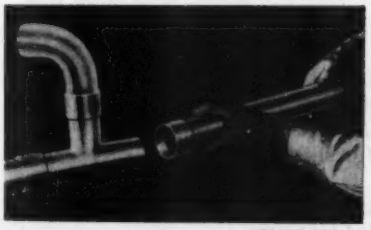
Circle No. 39 on Readers' Service Card

Photoelectric leukometer

Pictured above is a unit for measuring the percentage of whiteness and color of paper, cellulose, etc. The instrument is equipped with a built-in selenium photocell that produces a photo-electric current directly proportionate to the content of whiteness. The measurements are made by comparison to a standard white.

Measurements are not dependent on daylight, nor do they require a dark room, as illumination is provided by six 4-volt bulbs arranged in a circle. *EPIC Inc.*

Circle No. 40 on Readers' Service Card



Aligning connector for stainless piping systems

Brazed or welded connection of stainless piping systems may now be completed more easily with a new aligning connector.

The stainless connector has been designed to fit over the ends of pipe or fittings to provide a socket-type joint. The connector provides a snug fit that holds the pipe and fittings in position until welding or brazing secures the connection.

The connector has been designed specifically to be used with Speedline fittings and lightwall piping systems—Schedules 5 and 10. *Horace T. Potts Co.*

Circle No. 41 on Readers' Service Card

Pumps

Availability of Gould's most popular line of single-stage double-suction centrifugal pumps with ring oil bearings as well as grease-lubricated bearings has been announced. The pumps range in 33 sizes with capacities from 200-6400 gpm and heads to 425 ft.

The pumps are available in bronze-fitted, all-iron or all-bronze with certain sizes available in steel and stainless steel construction. *Goulds Pumps Inc.*

Circle No. 42 on Readers' Service Card

Telescope

Truly straight optical reference lines between distant points can now be established using the new Reflect-Align telescope. The telescope not only measures errors in angle and defects in parallelism, but also directly measures linear errors in flatness, alignment and concentricity in .00005-in. values. *F. T. Griswold Mfg. Co.*

Circle No. 43 on Readers' Service Card

New melt indices for polyethlene

Super Dylan high-density polyethylene is now being offered in a new and broader spectrum of melt indices. Shipping tolerances under the new nomenclature system are much narrower than heretofore.

Types 6060 and 6090 demonstrate outstanding clarity and ease of processing in the case of extruded film and coated papers. *Koppers Co. Inc.*

Circle No. 44 on Readers' Service Card

Device for regulating the tension of paper webs

Cons-Ten-Trol is a new device developed for automatically regulating the tension of webs of paper and other materials in unwinding to slitter-rewinders.

The unit can be added to any existing slitter-rewinder that has air-operated friction brakes on the unwind. *Dilts Div., Black-Clawson Co.*

Circle No. 45 on Readers' Service Card

Ball bearing adjusting screw and handwheel assembly for reducing valves

A new handwheel and ball bearing adjusting screw assembly, complete with finger-operated teardrop lock nut, is now standard equipment on all OPW-Jordan piloted pressure reducing valves. It is also optional on pressure reducing valves. *Jordan Industrial Sales Div., OPW Corp.*

Circle No. 46 on Readers' Service Card

No matter which *FINISH* you like—you can buy it in

MicroRold® QUALITY STAINLESS STEEL

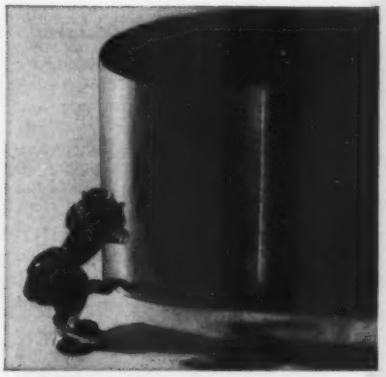
2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.



BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

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NEW LITERATURE

Books

HALBZELLSTOFFE (Chemical-Mechanical Pulps). By R. O. H. Runkel and K. F. Patt. Published by Guntter-Staib-Verlag, Biberach an der Riss, Germany.

This is a monograph about chemical-mechanical wood pulping processes that are used commercially in the production of semichemical and high-yield pulps, or "chemigroundwood".

Dr. Runkel is a well-known expert in this field and has made many pertinent contributions both in basic and applied research. In particular, the monograph deals with the definition and history of the processes involved, their characteristic features and commercial performance, and also with the properties of the pulps produced and their bleaching and utilization. In addition, economic questions of production and also the trend of development in the United States and Europe are discussed.

The monograph is in German with English translations of the preface and conclusions. It has 209 pages, 69 figures, 28 tables and 760 literature references. The book is well conceived and will undoubtedly hold valuable information to everyone working in this field.—*T. N. Kleinert.*

WEIGHING, LABORATORY TECHNIQUES. By H. U. Ulbricht. Published by Dechema-Erfahrungsaustausch, Frankfurt (Main), Germany. Pages: 125. Price: DM 50.— (to members of Dechema: DM 40.—).

"Weighing, Laboratory Techniques" is the theme of one of the series of the Dechema-Erfahrungsaustauch pamphlets that has just been published. It gives a review in the shortest and most concise form of all the types of balances that are used in laboratory techniques, starting with the technical balance with a relative weighing error of ± 10-3 up to the precision balances required in research laboratories with a sensitivity of 1 microgram.

A detailed definition of the terminology and the symbols used in formulae bear witness to the constant efforts made by the Dechema to achieve uniform methods of designation.

FLUOROCARBONS. By Merritt A. Rudner. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. Pages: 238. Price: $5.75.

Reinhold Publishing Corp. is making available a series of books that emphasizes the applications of the various types of commercial materials of the plastic industry.

In this book the author has covered the properties, chemistry, processing and fabrication techniques and final applications of fluorocarbons. The book demarcates the efficient use of these materials by describing their capabilities and limitations as compared with other plastics. Sufficient case histories are offered to emphasize the benefits derived from the fluorocarbons in solving a materials problem.

The electrical, mechanical and chemical applications are clearly described, and future applications are discussed from the standpoint of present trends.

INSULATION ENGINEERING FUNDAMENTALS. By Graham Lee Moses. Published by Lake Publishing Co., 718 Western Ave., Lake Forest, Ill. Pages: 117. Price: $2.75.

This book is based on a series of articles that appeared in the monthly publication, *Insulation*. It describes every phase of insulation: basic concepts, selection, application, construction and testing for large and small rotating machinery and electronic equipment.

The text attempts to present the fundamentals in simple, understandable terms that are accurate without being oversimplified. Another objective was to blend this diverse information from all sources into a concise yet comprehensive and objective view of the basic fundamentals of insulation engineering that may be applicable to all forms of electric apparatus.

USDA Reports

RESEARCH NOTES. Here are three Research Notes now available from the Southeastern Forest Experiment Station of the United States Department of Agriculture:

No. 117—Relative Fire Danger Descriptions.

No. 118—Cattle Stocking and Herbage Yield on Burned Flatwoods Ranges.

No. 119—Mountain Farm Woodland Grazing Doesn't Pay.

Write to Earl R. Sluder, Southern Appalachian Research Center, Asheville, N. C., for copies of these publications.

FOUR PUBLICATIONS that are now available free of charge from the U.S. Forest Products Laboratory are: Report on Progress in Development of Testing Methods for Fiberboards—Report No. 2105, which contains standard methods of testing for strength and fiberboards as insulation boards, hardboards and particle boards; A Graphic Method of Estimating Veneer Drying Rates—Report No. 2104, showing how a recently-developed chart aids in regulating commercial veneer dryers according to variations in veneer thickness and other factors; Technical Note No. 225, Cause and Prevention of Blue Stain in Wood, which outlines ways to control the fungi that grow in sapwood and cause blue stain, and Report No. 2108, Development of Methods for Evaluating the Machining Qualities of Wood and Wood-Base Materials, which explains how such machining operations as planing, shaping and others can be standardized to provide valuable data that lead to the better use of different species of wood. Write to the Director, U. S. Forest Products Laboratory, Madison 5, Wis.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Sodium and potassium borohydrides

Metal Hydrides Inc. is offering a 34-page manual of techniques covering the properties, reactions and handling requirements of sodium and potassium borohydrides. Included in the manual are detailed discussions of reactions in aqueous and nonaqueous solvents. Technical data compiled from the most significant works published to date are presented in 13 convenient tables.

Circle No. 47 on Readers' Service Card

Antifoam, leveling agent and solvent

Hodag Chemical Corp. has released a two-page information sheet and is also offering free samples of its PX-1. Hodag PX-1 is a proprietary combination of alcohols, hydrocarbons and surface-active chemicals for use as an antifoam, leveling agent and solvent in pulp and paper, adhesives and many other industries.

Circle No. 48 on Readers' Service Card

Cutting material handling costs

Manpower Inc., in a new booklet, has listed 100 ways to cut material handling costs. An analysis of the many facets of material handling and suggestions for effecting important economies are outlined. The booklet suggests ways of streamlining and economizing material handling procedures by applying sound management principles. Consideration is given to equipment, design and construction, conveying, storage, delivery, unloading, safety and administration.

Circle No. 49 on Readers' Service Card

Pressure leaf filters

T. Shriver & Co. Inc. is issuing a bulletin describing the company's pressure leaf filters for horizontal and vertical tanks.

PUT ACTION IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

New Literature . . .

The bulletin thoroughly describes both types of filters. Photos and line drawings are also included.

Circle No. 50 on Readers' Service Card

Indicating, recording and controlling thermometers

Minneapolis-Honeywell Regulator Co., in a 56-page catalog, describes the complete line of Brown rectangular case filled system thermometers. These indicators, recorders, transmitters and electric or pneumatic control instruments are described in detail.

Circle No. 51 on Readers' Service Card

Stainless steel tubing and pipe

Babcock & Wilcox Co., Tubular Products Div. is issuing a technical data card that summarizes hot working, annealing, welding and forming data on 24 of the widely-used austenitic and hardenable and non-hardenable ferritic stainless tubing steels.

Circle No. 52 on Readers' Service Card

Radial loads

Food Machinery & Chemical Corp., Peerless Pump Div. has published an 8-page bulletin describing the cause, effect and cure of damaging radial thrust forces on process pump impellers, bearings, wear rings, seals and stuffing boxes and the shaft itself. The bulletin has been prepared from the original research papers.

Circle No. 53 on Readers' Service Card

Polyethylene resins

Eastman Chemical Products Inc. explains how Tenite polyethylene resins can be used to make a wide variety of functional and attractive plastic products in a 36-page book now being offered. Sections on paper coating and on packaging are among the subjects covered.

Circle No. 54 on Readers' Service Card

Paper conditioner

Southworth Machine Co. is offering a data sheet describing the company's paper conditioner. The sheet explains the features of the unit along with other general information.

Circle No. 55 on Readers' Service Card

Slush-maker and Stock-maker

Morden Machines Co. is offering two catalog sheets, one containing information on the company's Slush-maker and the other on the company's Stock-maker. Both sheets show accessories, optional items and auxiliary equipment that can be used with these units.

Circle No. 56 on Readers' Service Card

What goes on inside paper machine dryers

Armstrong Machine Works has produced a new 15-min. 16-mm sound color movie entitled "Condensate Behavior in Rotary Dryers". The film clearly shows, in slow motion and standard speed, what happens to condensate inside a dryer at a wide range of speeds. It also shows how varying amounts of condensate behave differently at different speeds. Prints of this film are available without charge for showing to any groups or individuals who are interested in dryer drainage problems.

Circle No. 57 on Readers' Service Card

Liquid level gages and valves

Jerguson Gage & Valve Co. is issuing a condensed catalog illustrating standard and special function gages and valves. The catalog gives dimensional drawings, construction features, pressure-temperature graphs and ratings, materials, tables of sizes, specifications and standard and optional features.

Circle No. 58 on Readers' Service Card

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Design — **Consultations**
Paper & Pulp — **Reports**
Water & Waste — **Appraisals**
Steam & Hydro Power — **Steam Utilization**

Variable-area flowmeter handbook

Fischer & Porter Co. is issuing a handbook giving data on the company's variable-area flowmeter. Engineering data including tables, graphs and equations for application, sizing and flow rate calibration prediction of low flow rate rotameters are all described.

Circle No. 59 on Readers' Service Card

Double revolving disc refiners

Bauer Bros. Co. has prepared a four-page bulletin describing the company's 36- and 24-in. double-revolving disc refiners for the pulp and paper industry. Cutaway views show the individual construction features, and outline drawings show over-all dimensions.

Circle No. 60 on Readers' Service Card

Corrosion-resistant flow tube

Builders-Providence Inc. has released a new bulletin describing the company's corrosion-resistant insert plastic Dall flow tube. The bulletin includes photographs, dimensional and cost comparison tables, cutaway views and performance charts in addition to the explanatory text.

Circle No. 61 on Readers' Service Card

Corrosion-resistant plastic equipment

Haveg Industries Inc. announces the issuance of a bulletin that describes the selection of the proper plastic for each and every chemical corrosion problem. The bulletin is based on the work and findings of Haveg's field engineers over a period of the last 25 years.

Circle No. 62 on Readers' Service Card

Handbook of safety codes

Fire Equipment Manufacturers' Association Inc. has made available a handbook of safety codes. The handbook outlines the various procedures for maintaining, protecting, recharging and inspecting fire extinguishing equipment commonly used throughout the plant. Both mandatory and recommended procedures to be followed are described.

Circle No. 63 on Readers' Service Card

Nine Publications for Papermakers

Pulp and Paper, Volume I	**$18.00**
Pulp and Paper, Volume II	**18.00**
Paper and Paperboard Making	**6.00**
Technology of Paper Coating	**2.00**
Lessons in Papermaking—Part 1	**1.50**
Lessons in Papermaking—Part 2	**1.50**
Notes and Observations on Beaters	**1.00**
Trouble on the Paper Machine	**.75**
Technology of Papermaking Fibers	**.50**

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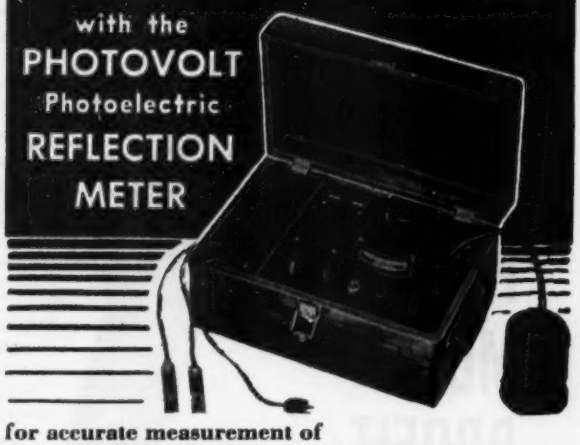

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OK Keozyme – High purity, consistent, carefully processed corn starch for enzyme conversion. Exacting quality control to insure low residue and optimum conditions for proper enzyme action. For surface sizing or pigment coating binder this starch offers highest quality available.

OK Keoclors – A new line of oxidized starches ... for coating adhesive and surface sizing application. Surface sizing at press or calender will benefit from controlled and stable viscosity, good penetration and color. Adhesive strength and colloidal characteristics offer improved bonding and operation for medium and low solids pigments coating.

OK Keocote – Enzyme converting corn starch with lower than normal peak viscosity. Particularly adaptable to operations requiring conversions at high starch solids or in presence of pigments. Low initial viscosity permits more rapid heat transfer and even conversion.

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MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.70— .75
No. 2 roofing (Chicago)	.40— .45
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

	per cwt.
New dark cuttings	Nominal
New mixed cuttings	
New light silesias	
Light flannelettes	
Unbleached cuttings	
New white cuttings	
New light oxfords	
New light prints	

Old Rags

	per cwt.
No. 1 white linens	Nominal
No. 2 white linens	
No. 3 white linens	
No. 4 white linens	
No. 1 white cottons	
No. 2 white cottons	
No. 3 white cottons	
No. 4 white cottons	
Extra light prints	
Ordinary light prints	
Medium light prints	
Dutch blue cottons	
French blue cottons	
French blue linens	
Checks and blues	
Linsey garments	
Dark cottons	
Old shopperies	

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	6.00— 7.00
No. 1 manila rope, foreign	5.00— 6.00
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	90.00—100.00
No. 1 hard white shavings	75.00— 80.00
No. 1 soft white shavings	45.00— 50.00
Soft white shavings, uncoated	45.00— 55.00
Fly leaf shavings No. 1	15.00— 20.00
Fly leaf, woody, No. 1	17.00— 22.00
Mixed colored shavings	15.00— 17.00
No. 1 books and magazines	13.00— 14.00
Ledger stock, white, No. 1	42.50— 45.00
Ledger stock colored, No. 1 (Midwest ship)	25.00—
New manila envelope cuttings (free of groundwood)	60.00— 65.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	65.00— 70.00
Colored tab cards	45.00— 55.00
New northern kraft envelope cuttings	55.00— 60.00
Triple sorted kraft, 100%	25.00— 30.00
No. 1 old kraft	—
White news cuts, No. 1	42.50— 45.00
No. 1 overissue news	16.00— 18.00
Folded news, special	14.00— 15.00
Folded news, ordinary	12.00— 13.00
Old corrugated boxes	24.00— 25.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	6.00— 7.00
No. 1 mixed paper	3.00— 4.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	60.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	115.00—
L. c. l., ton	125.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	29⅜—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb	.12½—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	9.05—
N	9.20—
WG	9.70—
WW	9.80—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M.	7.80—
N	7.90—
WG	8.25—
WW	8.50—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb.	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅛—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Uubleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	64.70
75% "	49.65
50% "	37.80
25% "	31.90
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	65.85
75% "	50.80
50% "	39.00
25% "	33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.50
60-lb.	8.75
50-lb.	9.00
40-lb.	9.25
35-lb.	9.75
30-lb.	10.50
25-lb.	11.25
20-lb.	12.25
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.00
Sheets — Plus 50c cwt)	

Names in the News . . .

(Continued from Page 390)

Richard T. Dando has been appointed sales engineer for Albany Felt Co. in a territory comprising Vermont, western Massachusetts, New Hampshire and eastern New York. He joined the firm in 1957 following service with the production section of Scott Paper Co.

Charles H. Kent has accepted an appointment as a consultant to the papermaking industry for Adell Chemical Co. of Holyoke, Mass. He will visit mills as a part of a long-range plan to extend to mills every possible help in solving problems relating to the use of d-i Lestoil.

Henry C. Miller has been named process engineer in the western sales region for John W. Bolton & Sons Inc. and the Emerson Mfg. Co. Div. He was previously industrial sales engineer for Honeywell Controls Ltd.

Whiting Corp. has announced the following changes: **Harvey K. Waters**, formerly of the Charleston, N. C. district office, has been named manager of the new Minneapolis office; **Melvin J. Beagle Jr.**, formerly associated with the Swenson Evaporator Co. Div. at Harvey, Ill., has been transferred to the Houston, Texas district office; **Thomas R. Elmblad** of the Chicago office is now headquartered at Pittsburgh; **John N. Brown** of the Swenson Div.'s Harvey plant has been transferred to the Chicago office.

R. E. Shook has been appointed sales manager of the Pulp & Paper Equipment Div. of Sprout, Waldron & Co. Inc. He has been with the firm since 1949 and since 1956 has been serving as special assistant to the vice president.

Necrology . . .

Edwin Sutermeister

Dr. Edwin Sutermeister, long honored for his researches in papermaking, died recently at Westbrook, Maine, at the age of 81.

Dr. Sutermeister retired in 1954 as chief research chemist for S. D. Warren Co. at Cumberland Mills. In 1935 he became the fourth individual to be awarded the Tappi Gold Medal. In addition to numerous papers published in technical journals, his best known works included "The Chemistry of Pulp and Papermaking", "The Story of Papermaking" and an American Chemical Society monograph, "Casein and its Industrial Applications".

Born in Milton, Mass., Dr. Sutermeister was graduated in 1899 from the Massachusetts Institute of Technology. It was in that year that he joined the staff of S. D. Warren to remain with that firm until his retirement, with the exception of 1907-1910. During those years he served as a chemist with the United States Forest Service at Washington, D. C., and Madison, Wis.

Among his contributions to the pulp and paper industry were the origination of the pebble mill test for evaluating paper pulp; the development and introduction of domestic clays for the loading and coating of paper; the development of starches and gums for paper coatings, and improvements in soda pulping and size manufacture and applications.

Active for many years in the work of Tappi, Dr. Sutermeister had served both as chairman of the Soda Pulping Committee and as chairman of the Coated Paper Committee.

C. Noble Mull

C. Noble Mull, chief engineer for Mead Corp., died early in August at a Chillicothe, Ohio hospital.

A native of Rushville, Ind., where he was born in 1897, Mull joined the Mead organization in 1922 as a draftsman for Management Engineering & Development Co. in Dayton. He was appointed a structural designer in 1924 and chief draftsman in 1926.

Mull became an engineer for Mead in 1931 and was made chief draftsman in 1936, a position he held until he was named chief engineer in 1952.

Charles S. Esty

Charles S. Esty, paper mill superintendent for St. Croix Paper Co. in Woodland, Maine, died recently at his home.

Born in Wytopitlock, Maine, in 1893, he became a "broke hustler" for St. Croix at the age of 14. Esty was made a fifth hand on the paper machines in 1922, after which several promotions brought him in 1950 to the position of boss machine tender. Then followed appointments as assisting superintendent and acting superintendent, and in 1955 he became paper mill superintendent.

Kenneth Cooke Brownell, 55, board chairman of American Smelting & Refining Co., died in August at a New York, N. Y. hospital. A native of Everett, Wash., and a graduate of Yale University, he joined the staff of American Smelting & Refining in 1927, becoming president in 1949 and board chairman and chief executive officer in 1957. Brownell was a director of Great Northern Paper Co.

George W. Donald, 60, died recently in Walnut Creek, Cal., following a long illness. He was director of sales for the Western-Waxide Div. of Crown Zellerbach Corp. Donald joined Western Waxed Paper Co. in 1928 at Emeryville, Cal., and became North Portland resident manager in 1948. At the time of his death he maintained his headquarters at San Leandro, Cal.

Dr. William Hale Charch, 60, director of the research that led to the development of moisture-proof cellophane for E. I. duPont de Nemours & Co. Inc., died recently at a Wilmington, Del. hospital.

Electric Helper Drives

(Continued from Page 359)

trol is interlocked with the operation of the section air clutch, so that the helper drive is calibrated automatically for proper operation when a section is clutched in or out. The only helper controls that require attention by the operator are the rheostat for adjusting total helper torque, load-indicating ammeters and ready-indicating lights. When more than one helper motor is used on the same section, individual motor field rheostats are included to permit the operator to adjust for different torque distribution among the helper motors. Most recent mechanically-driven machines that use helpers for running operation also utilize the helpers to provide for jog and slow operation of the wet end sections, with the air clutches open. This increases the clutch life and gives good control over the slow or wash-up speed.

In the case of a sectional drive, helpers are supplied as an integral part of the drive. For example, on a suction pick-up machine, the suction pick-up, wringer roll and transfer press helper motors will receive power from the same generator that supplies power to the main press drive motor.

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PAPER INDUSTRY

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Pusey & Jones tests new pressurized fourdrinier

The pressurized fourdrinier developed by Pusey & Jones Corp. has an enclosed pressurized headbox and a completely enclosed pressurized fourdrinier section.

Among the anticipated advantages of the new pressurized fourdrinier are: (1) increased rate of flow of white water through the wire; (2) reduction of fourdrinier length, wire and number of table rolls; (3) elimination of vacuum boxes and vacuum pumps; (4) reduction of frictional wear on the wire with consequent reduction of power requirements for drive equipment, and (5) reduction of paper breaks. A miniature model of the machine is now being tested at the University of Maine's laboratory.

Effective insect repellent

Complete insect protection with a repellent containing meta Delphene, developed by the USDA, has been reported by a chemist working in a mosquito- and fly-infested area in Mexico. Over a thirty-day period, not a single insect bite was observed and only a few insects actually settled on the skin to which the repellent was applied every four hours. The repellent is manufactured by Hercules Powder.

Shortleaf pine freed from hardwood competition by aerial spraying with herbicides

Low-quality hardwoods have been successfully and economically checked by aerial spraying with herbicides in areas where the growth of shortleaf pine is retarded due to competition from hardwoods. Aerial spraying is considered the cheapest and first satisfactory method in dealing with this problem.

Saskatchewan's forest resources can support four pulp mills

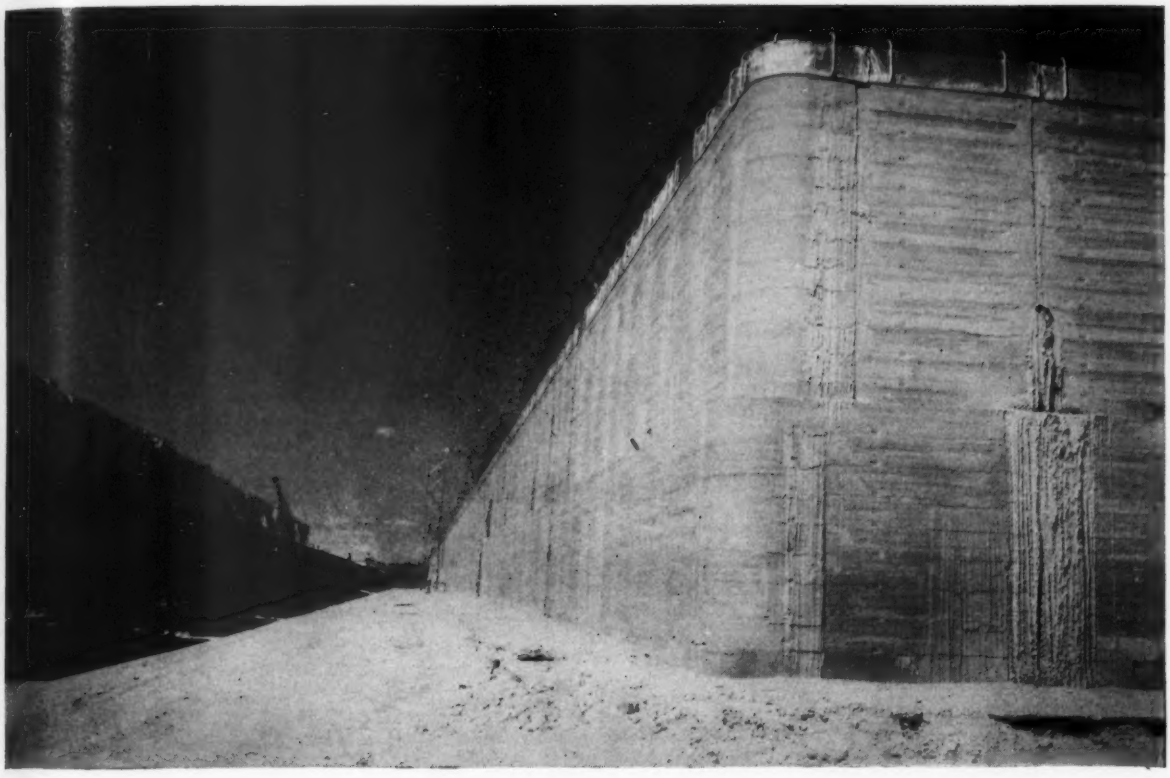
Saskatchewan's forest resources amount to 103 million cords of pulpwood and 15 billion board feet of sawtimber located in readily-accessible and commercial areas. The annual growth rate of this resource is 232 million cu. ft. It is estimated that this could support some four pulp mills in the province.

North of the presently accessible zone is another area that has the equivalent of 100 million f.b.m. and 55 million cords of pulpwood.

Uses of multiwall shipping bags

Paper used in 1957 in multiwall shipping bags amounted to 873,000 tons, while the 1958 consumption of paper for this purpose is expected to be near 850,000 tons.

As to the breakdown of the end-uses of multiwall shipping bags: 36 per cent are used for shipping fertilizer, various chemicals and chemical raw materials and drugs; 35 per cent for shipping agricultural and food products; 19 per cent for shipment of building materials; 8 per cent for shipping minerals, and 2 per cent in miscellaneous uses.



Stockpiling

...a continuing company policy established years ago

Stockpiling is a measure of service.

The government is stockpiling strategic materials for its long range defense program. Thus, it serves the citizenry. The producer of a raw material who as a company policy stockpiles also serves . . . serves its customers who in turn serve others by being able to count on a supply of the raw material in quantity.

The policy of Texas Gulf Sulphur Company has always been to stockpile . . . always producing *extra* for the future. In spite of the growing demands for the important basic material it produces—Sulphur . . . the company's policy has been to keep on hand stocks equal to about a year's normal demand. With such a supply, it can make shipments, routine or emergency, of any tonnage, at any time, by any method.

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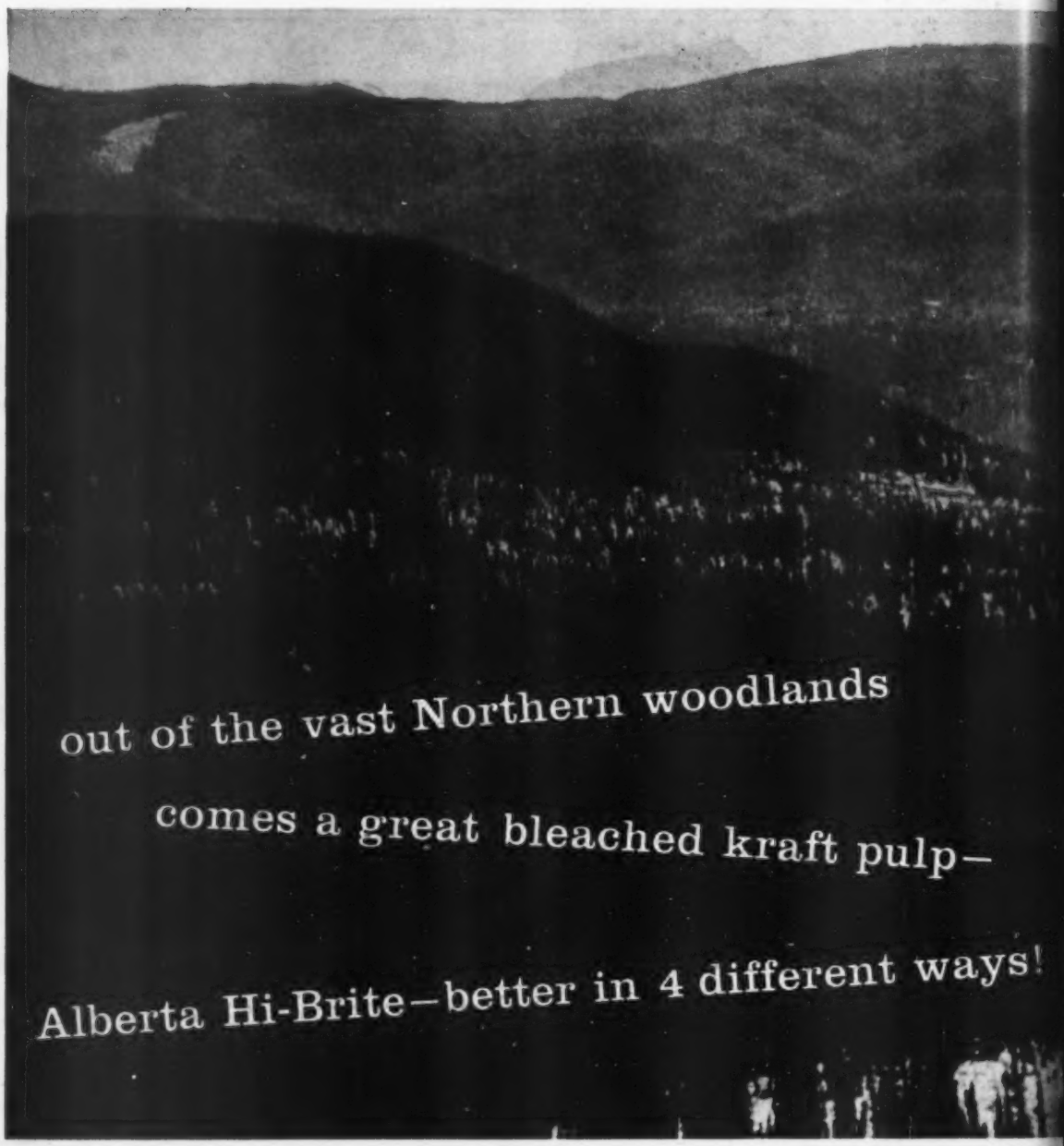

1 Alberta Hi-Brite is made from the long thin fibers of spruce and lodgepole pine . . . fibers famous for producing the best quality bleached kraft pulp. It imparts to your paper an unusually high degree of *folding and tensile strength* along with outstanding opacity and cleanliness.

2 Alberta Hi-Brite is the one bleached kraft pulp which not only gives your paper strength, but also formation and printability —qualities usually associated *only* with low strength pulps.

3 The new multi-stage chlorine dioxide bleaching process, exclusive to Alberta Hi-Brite, provides your pulp with whiteness and brightness suitable for producing even the finest writing papers.

4 And most important—Alberta Hi-Brite has the unique ability to develop good characteristics *whether the paper you produce calls for light or extensive refining.*

For full details on how Alberta Hi-Brite can improve your product, write Dept. PI-958, St. Regis Paper Company, 150 East 42nd Street, New York 17, N. Y.

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